July 16, 1968 C. A. BEHNEY 3,392,725

VETERINARY OPHTHALMIC APPLICATOR

Filed Jan. 17, 1966

Fig. 1

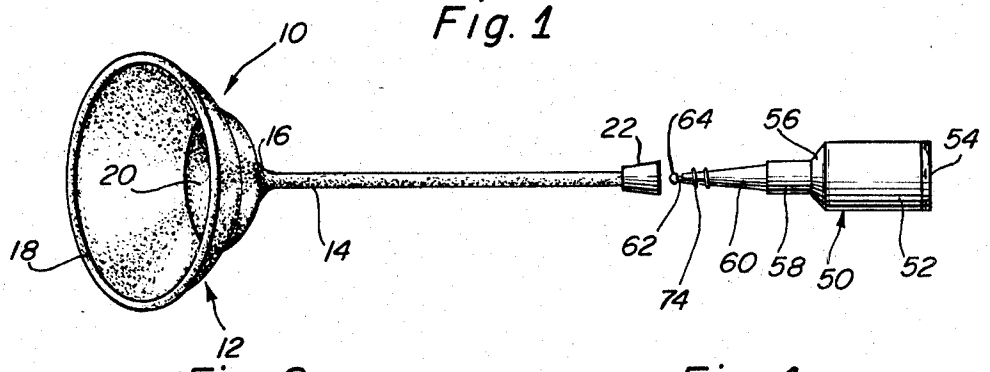


Fig. 2

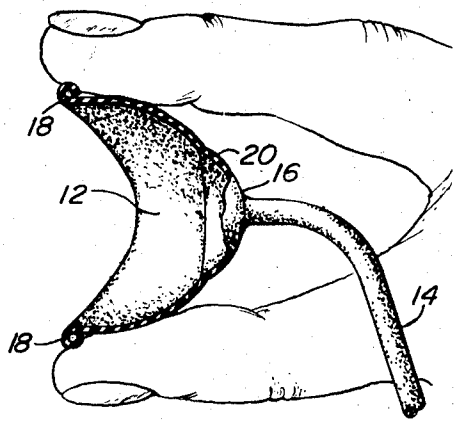


Fig. 4

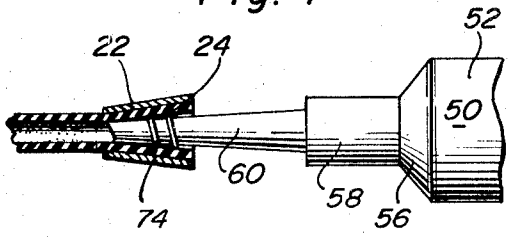


Fig. 5

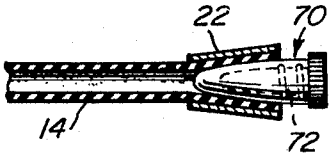
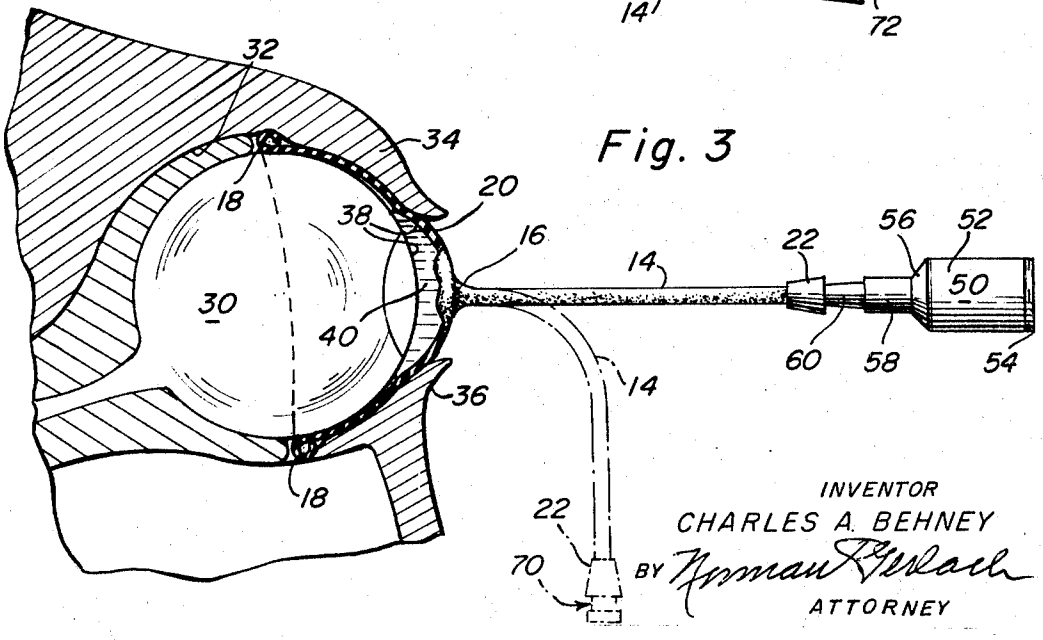


Fig. 3



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VETERINARY OPHTHALMIC APPLICATOR

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The present invention relates to an ophthalmic applicator for use primarily in the treatment of acute conjunctivitis (pink eye) in animals, specifically cattle, and, toward this end, the invention contemplates the provision of a novel and improved eye shield having means associated therewith whereby it may, after installation in the eye socket of an animal, be supplied with a suitable therapeutic ointment which is obtained from a commercially available squeeze tube containing such ointment.

According to the present invention, the applicator comprises a cup-shaped eye shield embodying a rim region which is designed for insertion into the eye socket between the eyelids and the eyeball of the animal to be treated, the shield having in its central or apex portion an opening in communication with a relatively short flexible tube through which the ophthalmic ointment may be forced into the interior of the shield after the latter is in position within the eye socket. After initial insertion of the shield into the eye socket and introduction of the ointment into the shield interior, the shield is designed to remain in place either for a prolonged period of time or until the condition for which the applicator is designed to remedy has been alleviated. The ointment is supplied from a commercially available squeeze tube having a comparatively long conical applicator nozzle by inserting the nozzle into the distal or free end of the flexible tube and then squeezing the tube to force the ointment out of the squeeze tube and through the flexible tube into the interior of the cup-shaped eye shield. After the requisite quantity of ointment has been thus applied to the eyeball, the closure cap for the nozzle of the squeeze tube, instead of being discarded, is employed as a closure for the free end of the flexible tube and it is designed to remain in place within such end of the flexible tube in order to prevent egress of the applied ointment from the eye shield. Repeat applications of ointment to the eyeball may be resorted to, if necessary, without removing the eye shield from the eye socket, these applications being made from a fresh squeeze tube through the flexible tube of the originally installed eye shield.

The features of novlety of the present invention reside in (1) the broad concept of supplying a therapeutic ointment to an eye shield (as distinguished from an eyewash cup) while the latter is in situ within the eye socket of the animal to be treated; (2) the provision of a novel expanded eye shield rim which establishes an effective seal for preventing working of the ointment outwardly of the shield and forwardly thereof along the eyelids; (3) the provision of a reinforcing collar at the distal or free end of the flexible tube to withstand the expanding force of both the squeeze tube applicator nozzle and the removed closure cap for the nozzle of the squeeze tube; and (4) the use of the closure cap as a stopper or seal for the flexible tube, thereby eliminating the necessity of employing a tube clamp or other valve means for retaining the ointment within the eye shield when the applicator is in use.

The provision of an ophthalmic applicator of the character briefly outlined above and possessing the stated advantages therefor, constituting the principal object of the invention, numerous other objects and advantages will readily suggest themselves as the nature of the invention is better understood from a consideration of the following detailed description.

In the accompanying single sheet of drawings forming a part of this specification, one illustrative embodiment of the invention is shown.

In these drawings:

FIG. 1 is a perspective view of a veterinary ophthalmic applicator embodying the invention, an ointment-containing squeeze tube being illustrated in position to have its nozzle inserted into the free end of the flexible tube of the applicator as a preliminary to expressing the ointment from the squeeze tube into the eye shield;

FIG. 2 is a side elevational view of the applicator, such view illustrating schematically the manner in which the eye shield part of the applicator may be manually distorted preparatory to application thereof to the eyeball of the animal to be treated;

FIG. 3 is a fragmentary sectional view illustrating the application in situ within the animal's eye socket;

FIG. 4 is an enlarged fragmentary view, partly in section and partly in elevation, illustrating the manner in which the nozzle of the squeeze tube is inserted into the free end of the flexible tube as a preliminary to squeezing of the squeeze tube in order to express the ointment from the tube and cause it to flow through the flexible tube into the eye shield interior; and

FIG. 5 is an enlarged fragmentary view similar to FIG. 4 but illustrating the manner of sealing the flexible tube of the applicator against the outflow of ointment therefrom.

Referring now to the drawings in detail, the applicator of the present invention is in the form of a molded plastic unit **10** consisting of a cup-shaped eye shield **12** from which there projects axially and forwardly a flexible tube **14**, such tube being relatively short, i.e., only a few inches in length. The plastic material from which the eye shield and its flexible tube of the applicator are formed is preferably polyethylene. It is desirable that the material be of a transparent or translucent nature in order that when the eye shield is operatively installed in the eye socket of an animal in a manner that will be described presently, light will not be totally excluded from the animal's eye.

As best seen in FIG. 3, the flexible tube **14** communicates with the interior of the cup-shaped eye shield **12** through a flared throat **16** which merges gradually with both the tube **14** and the central or apex portion of the shield.

The circular open rim of the eye shield is formed with an out-rolled edge or bead **18** which serves the dual function of reinforcing the rim and of establishing a seal within the eye socket when the eye shield is installed therein as will be described presently. The central region of the cup-shaped shield is formed with a forwardly offset portion **20** with which the tube **14** communicates via the throat **16**.

The distal or free end of the flexible tube **14** has applied thereto in surrounding relationship a frusto-conical reinforcing nipple **22** of relatively small slant height and slant angle, said free end of the tube being flared, as indicated at **24**, into intimate contact with the inside wall surface of this nipple and also being suitably adhered thereto as, for example, by heat sealing or a suitable adhesive.

The manner in which the above-described ophthalmic applicator is applied to the eye of an animal is schematically illustrated in FIG. 3 wherein the eyeball is designated by the reference numeral **30** and the eye socket **32** is established by the positioning of the upper and lower eyelids **34** and **36** over the forward region of the eyeball. By compressing the eye shield **12** between the thumb and forefinger as shown in FIG. 2, the rim region of the shield may be distorted to facilitate its introduction into the eye socket **32**. After release of the rim region, the shield will resume its original shape and fit over the eyeball **30** with its rim region interposed between the eyeball and the two eyelids **34** and **36**. The offset portion **20** of the eye shield

12 will then lie between the two eyelids and, in combination with the cornea portion of the eyeball, establish a cavity or chamber 38 which is designed for reception therein of a suitable therapeutic ointment 40.

The ointment 40 is supplied to the cavity 38 from a commercially available squeeze tube 50 (see FIGS. 1, 3 and 4) which preferably is of the so-called "one-shot" type wherein the tube 50 contains a sufficient measured quantity of the ointment precisely to fill the cavity 38 and the flexible tube 14 leading thereto. The squeeze tube 50 is conventional or standard and no claim is made herein to any novelty associated therewith except insofar as its combination with the present ophthalmic applicator is concerned. Said squeeze tube 50 involves in its general organization a flexible aluminum or other foil body 52 of tubular configuration, the rear end of such body being sealed by crimping as indicated at 54 in the usual manner. The forward end of the squeeze tube 50 is formed with a relatively rigid frusto-conical head 56 from which there projects forwardly a cylindrical support portion 58. The latter terminates in a frusto-conical applicator tip or nozzle 60 of appreciable slant height and small slant angle. The forward or discharge end region of the applicator nozzle 60 is formed with a weakened portion in the form of an annular groove 62 which facilitates tearing, snipping or otherwise removing the extreme tip 64 of the nozzle in order to afford an outlet for the ointment within the tube as is customary in connection with conventional squeeze tubes.

The squeeze tube 50 is applied to the applicator 10 by inserting the outer end of the nozzle 60 completely through the flared portion 24 of the flexible tube 14 (see FIG. 4) and so that it terminates adjacent to the small base of the frusto-conical nipple 22 and compresses the adjacent portion of the wall of the tube 14 against said small base, thus sealing the nozzle 60 to the tube 14. The body portion 52 of the squeeze tube is then squeezed or otherwise flattened to expel the ointment from the tube 50 and force the same through the flexible tube 14 and into the chamber 38 where it comes into contact with the eyeball 30. After the squeeze tube 50 has thus been emptied of its contents, the nozzle 60 is removed from the distal or free end of the tube 14 and such end of the tube is then sealed in a convenient manner by forcing the usual threaded closure cap which is supplied with the squeeze tube into the flared free end part 24 of the tube 14 as will be described presently.

Commercial squeeze tubes of the type under consideration are sometimes provided with threaded closure caps such as the cap shown at 70 in FIG. 5, the cap being of frusto-conical design and being internally threaded as at 72 for threaded reception over a short threaded section 74 near the outer end of the applicator nozzle 60. By way of explanation, it is pointed out that the term "one-shot" as employed herein has no significance except only insofar as it relates to the intended use of the squeeze tube 50. Insofar as the manufacturer is concerned, if a particular squeeze tube contains a medication in a measured quantity that is intended to accommodate but one application to a patient, either animal or human, then the manufacturer and prescribing physician or veterinarian will designate such a tube as a "one-shot" tube. On the other hand, a squeeze tube which may constitute a "one-shot" tube for one given ailment may not constitute a "one-shot" tube for a different ailment. Where a squeeze tube is definitely known to be a "one-shot" tube, it ordinarily will not be supplied with a closure cap such as the cap 70. Even though the volumetric content of a tube may be extremely small, such content may be adequate for repeated application to the afflicted part and, in such an instance, the manufacturer will market the tube with a closure cap which may be replaced on the applicator nozzle after each application. The present invention contemplates that, although strictly speaking, the applicator 10 shall completely consume the contents of the squeeze tube 50, thereby classifying such tube as a "one-shot" tube, the tube shall be supplied with the closure cap 70, the cap serving as a convenient closure, not for the squeeze tube after it has been opened, but for the distal or free end of the flexible tube 14 after the contents of the squeeze tube have been discharged from such tube into the chamber 38 in the manner previously described. In FIG. 5, the threaded closure cap 70 is shown as being operatively installed in the flared end part 24 of the flexible tube 14. The metal nipple serves to confine the wall of the tube 14 so that it becomes compressed against the outer surface of the closure cap 70 and thus effects a seal against egress of ointment from the tube 14.

With the closure cap 70 in position within the flared end part of the tube 14, when the tube is manually released its extreme flexibility will allow the same to hang vertically as indicated in dotted lines in FIG. 3. Since the tube 14 is relatively short, the applicator 10, when installed in the animal's eye socket, offers no discomfort to the animal and there is no danger of the flexible tube becoming entangled with foreign objects when the animal is grazing or reclining. No optical discomfort is offered by the applicator inasmuch as the plastic material of the shield portion 12 of the applicator will admit light to the cornea, the ointment likewise being of a translucent or transparent nature.

When it is desired to remove the applicator 10 from the eye, it is merely necessary for the operator to remove the closure cap 70 from the flared end part 24 of the tube 14 in order to vent the chamber 38 to the atmosphere. After removal of the cap, the flexible tube 14 is used as a pull cord in order forcibly to pull the eye shield 12 from the animal's eye socket 32.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit or scope of the invention. Therefore, only insofar as the invention is particularly pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. An ophthalmic applicator of the character described and comprising: a unitary thin-walled flexible cup-shaped eye shield of generally hemispherical configuration, presenting a generally circular open rim, said shield being formed of molded plastic material of a light-transmitting translucent nature and being adapted to fit over an eyeball with the rim region thereof interposed between the eyeball and the upper and lower eyelids of the eye to be treated and with the central or apex region of the shield opposing the cornea of the eyeball, said shield being formed with an integral flexible tube which is in communication with the interior of the shield and projects forwardly from the convex side of the shield in said central or apex region thereof and through which tube a therapeutic ointment is adapted to be forcibly projected for introduction of the ointment into the confines of the shield.

2. An ophthalmic applicator as set forth in claim 1 and wherein the circular open rim of the eye shield is provided with an enlarged annular bead for establishing a seal around the rim of the shield to prevent agress of the ointment from the shield forwardly along the eyelid regions of the eye socket.

3. An ophthalmic applicator as set forth in claim 2 and wherein said enlarged annular bead is in the form of an outrolled rim.

4. An ophthalmic applicator as set forth in claim 1 and wherein said central or apex region of the cup-shaped eye shield is offset outwardly beyond the general hemispherical confines of the shield so as to establish an ointment-containing chamber in front of the eyeball when the shield is in position on the eyeball.

5. An ophthalmic applicator as set forth in claim 1 and wherein the distal end region of the flexible tube is flared outwardly for reception therein of a closure cap associated with a commercially available squeeze tube containing a supply of therapeutic ointment.

6. An ophthalmic applicator as set forth in claim 5 and including, additionally, a rigid tubular frusto-conical nipple surrounding and in intimate contact with the flared distal end region of the flexible tube.

References Cited

UNITED STATES PATENTS

2,826,194	3/1958	Golden	128—173
3,170,462	2/1965	Hall	128—249
3,261,355	7/1966	Burbig	128—249

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