

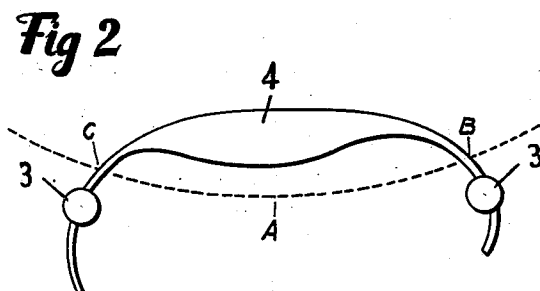
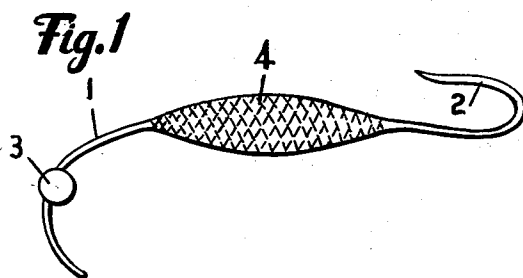
Jan. 13, 1953

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2,625,158

SUBCUTANEOUS MEDICATION

Original Filed Dec. 15, 1945



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2,625,158

SUBCUTANEOUS MEDICATION

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Alexander, Indianapolis, Ind.Original application December 15, 1945, Serial No.
635,266. Divided and this application June 14,
1950, Serial No. 168,012

3 Claims. (Cl. 128—260)

1

The present invention broadly relates to the subcutaneous administration of medicaments.

Particularly, our invention relates to a device for and a method of implanting medicaments subcutaneously in such a manner that the medicament comes in direct contact with body tissues and after remaining in place for a period of time any residual medicament can be readily removed.

More specifically, the invention relates to a device for implanting hormones or hormone-like substances subcutaneously in poultry, said device having a means for removing any residual hormone material after a period of time.

In the field of drug therapy, it is a well established principle that the subcutaneous route of administration produces a most desirable type of response. In some cases, i. e., when it is desired to obtain continued medication over a period of time, it is usually necessary to give repeated subcutaneous injections at frequent intervals, especially when the medicament is in a liquid form. It has been determined that when solid medicaments in the form of fused pellets or compressed tablets are implanted subcutaneously, the rate of absorption by the body is such that a continuous and desirable type of therapeutic action is produced. There are, however, certain disadvantages which result from the subcutaneous administration of pellets or tablets. One of these disadvantages is that in some instances, the rate of absorption is such that toxic symptoms are produced, and it is extremely difficult to locate and remove the medicament before serious consequences result. Another disadvantage is that when medication is desired for a prolonged period of time, there is a tendency for the pellet to be walled off by body tissues in such a manner that drug absorption is seriously hindered. In the treatment of domestic animals for improving their flesh quality by pellet implantation, it is necessary to discard the portion of the animal in which the implantation was made in order to avoid possible harm from consumption of the meat. Still another disadvantage of the ordinary pellet implantation technique is that a special trocar or similar instrument is required for making the implant or an operative procedure must be employed.

It is an advantage of the present invention that a device and means for the subcutaneous administration of medicaments is provided which avoids the disadvantages enumerated above.

Another advantage of our invention is that a device is provided which has means for maintaining a medicament in direct contact with body tissues after subcutaneous administration and in such a manner that the medicament can be withdrawn at any time desired to avoid toxic manifestations of the drug or for any other reason.

It is also an advantage of our invention that a unitary device comprising a medicament holder and a medicament is provided which can be

2

readily implanted subcutaneously, held in position, and removed at any desired time.

It is an especial advantage of our invention that a device and method is provided for the subcutaneous administration of hormone-like materials to poultry whereby the hormone effect can be maintained for any desired period of time and after which time any residual material is easily removed.

The present invention is particularly well suited for the subcutaneous administration of hormones and hormone-like materials. In this connection, it is suited for the administration of any of the naturally occurring hormone materials or any of the synthetic organic compounds having a hormone-like action. Included among such hormone materials are estrone, estradiol, progesterone, testosterone, gonadotropic hormones, lactogenic hormones, diethylstilbestrol, hexestrol, 2,4-di(p-hydroxyphenyl)-3-ethylhexane and the like.

The present invention can also be used for the subcutaneous administration of chemotherapeutic agents including the various sulfonamides, penicillin, streptomycin and the like. Similarly, the present invention can be used for the subcutaneous administration of arsenicals, organic bismuth compounds and other antiluetic.

It is evident from the foregoing that our invention is adapted for the subcutaneous administration of any medicament wherein a continuous therapeutic effect is desired and wherein for any reason the medicament might need to be removed.

In order that the invention may be clearly understood, reference is made to the accompanying drawings, in which:

Figure 1 is a perspective view of our device.

Figure 2 is a plan view of the device of Figure 1 secured to the skin as when in use.

The device shown in Figure 1 is preferably composed of woven cloth, glass, plastic or similar material in such a manner that a relatively wide surface area 4 is provided and having cord-like ends 1 and 2. The woven area 4 is porous in nature so that a melted or fused medicament may be applied thereto and after solidification, the medicament will be readily retained. The end portions 1 and 2 are such that either can be threaded into the eye of a needle (not shown), drawn through the skin A at the point B and out again at the point C. A lead shot 3 with a slit therein or similar clamping device is then placed on each of the ends in such a manner that the device is held in position. In lieu of the clamping means the cordlike ends can simply be tied together. After any desired period of time one of the clamps 3 can be removed and the device withdrawn by pulling on the opposite end. In operative position, as shown in Figure 2, it is seen that the drug adsorbed and/or held by the portion 4 presents a large surface area for absorption and that the residual drug will be withdrawn along with the device.

As described herein, it is apparent that our invention comprises a device for the subcutaneous implantation of medicaments comprising a body having a woven area adapted to retain a solid medicament with a large proportion of the solid medicament's surface being exposed, a solid medicament suitable for subcutaneous use retained by said woven area, said woven area tapering to cord-like ends adapted for introducing the medicament retaining portion of the body subcutaneously, said cord-like ends adapted for fastening the body in position after introduction and also adapted for withdrawing the body. One of our preferred embodiments is a device for the subcutaneous implantation of medicaments comprising a flexible body having a woven area adapted to retain a solid medicament with a large proportion of the said medicament's surface being exposed, a solid medicament suitable for subcutaneous use retained by said woven area, said woven area tapering to cord-like ends, at least one of said ends adapted to be threaded on a needle.

In practicing the present invention, it will be readily seen that our device is designed to hold a solid medicament underneath the skin of an animal in such a manner that a relatively large area of the medicament is exposed directly to the body tissues and that means are provided for withdrawing the holding device together with any unabsorbed medicament at any given time. Many of the medicaments used subcutaneously are solid substances at body temperatures. When these solid substances are not injured by heat, they may be melted and poured directly onto our device or the device may be dipped therein. Some solid drugs injured by heat may be mixed with auxiliary solid substances having relatively low melting points such as the waxes, higher fatty alcohols and the like liquefied by heat and used as indicated above. Suitable auxiliary substances include beeswax, cholesterol, cetyl alcohol, lanolin, polyvinyl alcohol, polyethyleneglycols and the like or mixtures thereof. Similarly liquid medicaments may be mixed with solid inert diluting materials such as the waxes, solid alcohols, and these mixtures employed for producing a suitable product for applying to our device.

In "Poultry Science," vol. 24, March 1945, beginning with page 128, there is an article by F. W. Lorenz, entitled "The Influence of Diethylstilbestrol on Fat Deposition and Meat Quality in Chickens." Lorenz in this article indicates that while stilbestrol pellets produce a very desirable effect upon the quality of poultry meat, there are some problems that should be solved. For example, he states on page 130:

"A problem not solved previously (Lorenz, 1943) was raised by the presence of pellet residues at killing time. Such residues represent a wastage of active material, and they would be objectionable if inadvertently ingested by the consumer. This danger may be minimized by placing the pellet in a part of the bird not usually eaten—i. e., high in the neck—but the only completely satisfactory solution to the problem would be a pellet that is completely dissolved before the bird is killed."

On page 132, he describes a method whereby he proposed to solve the problem:

"The problem, apparently, is to produce a pellet that will maintain a high rate of absorption throughout the treatment period and yet be completely absorbed at the end of the period. The dilemma arises from the necessity of maintaining

a large surface area in order to have rapid absorption. An attempt was made to resolve this difficulty by coating sugar pills with the fused diethylstilbestrol."

In actual practice, our device can be very satisfactorily employed for the administration of diethylstilbestrol to poultry. The holding device, with the desired amount of diethylstilbestrol, may be inserted subcutaneously in the neck of the fowl, secured in position and allowed to remain for a period of from two to four weeks. If further treatment is desired, it is only necessary to insert a new holder at the time the other is removed. In order to avoid the possibility of the consumer ingesting diethylstilbestrol that may be stored in the various organs or tissues of the fowl, it is usually desirable to remove the diethylstilbestrol and holder a few days before the bird is to be killed or marketed. In this way, the drug would be eliminated from the organs or tissues before being consumed for food.

It is apparent from the foregoing that our invention can be varied to a considerable extent without departing from the spirit thereof. The invention is, therefore, to be broadly construed in accordance with the appended claims.

The present application is a division of our application Serial No. 635,266, filing date December 15, 1945, now Patent No. 2,546,759 granted March 27, 1951.

We claim:

1. A device for the subcutaneous implantation of medicaments comprising a body having a woven area adapted to retain a solid medicament with a large proportion of the solid medicament's surface being exposed, a solid medicament suitable for subcutaneous use retained by said woven area and having a large proportion of its surface exposed, said woven area tapering to cord-like ends adapted for introducing the medicament retaining portion of the body subcutaneously, said cord-like ends adapted for fastening the body in position after the introduction and also adapted for withdrawing the body.

2. A device for the subcutaneous implantation of medicaments comprising a flexible body having a woven area adapted to retain a solid medicament with a large proportion of the said medicament's surface being exposed, a solid medicament suitable for subcutaneous use retained by said woven area and having a large proportion of its surface exposed, said woven area tapering to cord-like ends, at least one of said ends adapted to be threaded on a needle.

3. An article of manufacture comprising the device of claim 2 in which said solid medicament retained by said woven area comprises diethylstilbestrol.

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