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AMPULLA STRUCTURE

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Fig. 1

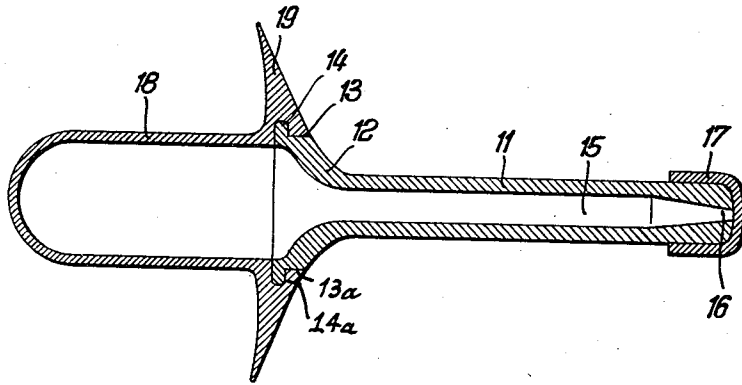
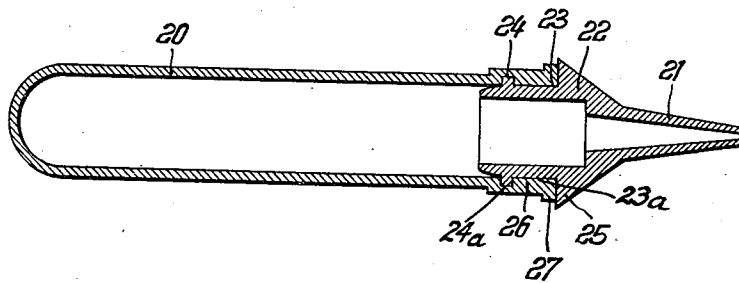


Fig. 2



Inventor:

Richard Mann
BY *Herbert M. Strauss*
ATT.

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Gerhard Mann, Berlin-Charlottenburg, Germany

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1 Claim. (Cl. 128—232)

This invention relates to a two-part ampulla or like structure for administering injections of medicinal and like preparations, which structure constitutes a small packaged item, preferably for single use.

It is one of the objects of the invention to provide means facilitating inexpensive manufacture of ampullae of the aforesaid type which are extremely compact and handy, may be manufactured from any suitable resinous and like materials, and are discardable after use, as the material thereof is of minor or very little value.

It is a further object of the present invention to provide means affording the construction of an effective and easily operable ampulla structure which may be carried around by doctors and patients and lends itself to extensive use in hospitals, ambulances, infirmaries and the like.

Still another object of the present invention is to provide an ampulla of the aforesaid type which may be readily filled and quickly assembled by plug and socket connection, said ampulla receiving a required quantity or dosis of substance to be administered, being hygienically transported and shipped and readied for use at any time.

It has already been known to manufacture ampullae from rubber or resinous material either as a single or two-part unit, whereby the top or front part is tubular, is of predetermined stiffness and stability in order to insert the same into hollows of the human body, wounds and other openings, a squeezable and elongated, hollow rear part made from elastic material being fixedly joined to said front part. Upon squeezing this rear body part either by means of a piston or by pressure exerted against the wall of the elastic hollow body part medicinal or like preparations contained in the latter were completely or partly transferred into the tubular front part or piece for injection purposes.

The connection between two-part injector or syringe ampullae forming small, handy packages offered, however, considerable difficulties, since the front and rear parts of the ampulla had to be firmly bonded or screwed together.

Shrinkages of the rim of the elastic part on the corresponding front part were highly undesirable, in particular, if the front part had to be inserted into a delicate or inflamed hollow of a human body, covered joints being only available, if complicated inner connections or outer screw threads were applied to such ampulla structures, which could not be considered reliable in all respects.

The present invention overcomes these and other disadvantages and contemplates a disconnectable, reliable tight joint between the adjacent rims of the front and rear parts by means of plug and socket-suction fitting, said rims including respective engageable tightening surfaces of considerable extent. Any heating or heat influences on the filled-in substance at the joint of the two parts, as was heretofore observed, will now be avoided and sufficient and safe ampulla tightness is obtained,

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which ensures transportation and its hygienic application under all circumstances.

This result may also be attained whether the top or front and rear parts are made from materials having relatively small elasticity or the front part is manufactured from a material of smaller elasticity than that of the squeezable, hollow rear body part. In the last case, however, the rim of the rear part must be sufficiently enlarged and reinforced within the range of the portion to be joined or coupled together.

It is further proposed according to the invention to provide a flange portion which is curled or shaped toward its outer end, in order to enhance its stiffness.

In order to avoid that such joint be brought into contact with the patient's body or will be held close to an inflamed wound or hollow body part, the present invention aims at the provision of an abutment piece between the effective surface of the tubular-shaped front part and the effective surface of the squeezable rear part, which abutment piece automatically limits the depth of introduction of the front piece or part into a hollow of a human body.

According to the invention this abutment piece has the shape of a roof extending toward the outer surface of the squeezable rear part so that the hand of an operator placed on the squeezable rear part for actuation of the latter, is also protected against incidental contact with infectious or highly sensitive portions of the human body to be treated.

An abutment piece in the form of a roof or shield may also be employed according to the invention to stiffen or reinforce the rim of the elastic rear part, when the latter is fixedly connected to or made from one piece with the front part.

The joint thus obtained with a suction engagement between the front and rear parts of the device may have also a further tightening safety factor in the form of interengageable groove and welt provided as coupling means on the rims of the front and rear parts, which hold together like a tight coupling.

These and other objects of the invention will become further apparent from the following detailed description, reference being made to the accompanying drawing, showing preferred embodiments of the invention.

In the drawing:

Fig. 1 illustrates a two-part ampulla device with a roof-shaped abutment shield embodying the invention, the device being constructed for a single application and to be discarded thereafter.

Fig. 2 shows a somewhat modified injector ampulla, in which the abutment piece has a reduced circumference in regard to the rear part of the two-part ampulla, the rear part being suitable for holding a substance for several applications.

Referring now more particularly to the drawing there is shown in Fig. 1 an ampulla made according to the invention having an open-ended tubular-shaped head or front piece 11 which is enlarged and flares outwardly at its one end 12. The outer rim 13 of this tube enlargement end 12 is provided with a cylindrically shaped surface 13a and also with a welt 14 for effectuating a suction, as well as a plug and socket engagement with a complementry-shaped end of a rear piece part 18 about to be described.

The bore 15 of the tubular front piece may vary according to requirements and is preferably conical throughout or tapers stepwise toward the mouth piece 16 of the tube. This mouth piece 16 is preferably slightly rounded at its corners and is closed by an elastic cover or cap 17, in order to protect the mouth piece 16 and contents of the ampulla during shipping and storage. The head or front piece 11 is made from a material of re-

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duced elasticity, for instance, from polystyrene or other known resinous material or it may be manufactured from a highly elastic material, whereby it is practical to change the wall thickness of said piece accordingly in order to obtain the required stiffness or rigidity for the front piece 11. The cap 17 may be made from polyethylene or like resinous material, so that the same elastically engages over the mouth 16.

The rear piece 18 is bulb-shaped and made from an elastic material. The open rim or edge of this hollow body 18 is enlarged and reinforced at its free flange 19 in order to facilitate engagement of complementary parts 13a, 14a with parts 13, 14 of front piece 11. Additional stiffening or reinforcement is obtained by the specially shaped flange 19 extending outwardly and rearwardly from the forward end of hollow body 18. The inner cylindrical rim 13a fits snugly against cylindrical fitting face 13 of the front piece while welt 14 of the latter engages simultaneously an annular groove 14a provided in flange 19.

The other wall surface of reinforced end 12 of front piece 11 provides a smooth transition to the corresponding outer surface of the flange 19 and forms together with the latter a roof- or shield-shaped abutment piece.

After the interior of hollow body 18 is filled up with a suitable substance the reinforced end 12 of the front part 11 may be readily brought into engagement position by pressing onto the end of body 18, as seen in Fig. 1, whereby circular welt 14 tightly fits into annular groove 14a and simultaneously maintains a tight fit engagement between cylindrical surfaces 13 and 13a.

According to Fig. 2 there is shown a press-button-like plug and socket joint for rear piece 20 engageable with front piece 21 having an enlargement 22 with cylindrical fitting surface 23 and circular welt 24 projecting beyond surface 23 and directly connected thereto. In this particular instance over fitting surface 23 and welt 24 extends a roof-shaped and laterally projecting enlargement 25 forming part of enlarged flange 22 of the tubular front piece 21. The rim of this enlargement 25 of the front piece 21 only slightly projects beyond flange 27 of the rear piece 20.

As shown in Fig. 2 rim 26 of the bottom or rear piece 20 is somewhat enlarged and reinforced so as to be shaped for engagement with the corresponding surfaces at 23, 24 of the front piece 21. Enlargement 26 and flange 27 afford together a suitable support for the elastic wall of the bulb-shaped rear piece 20, forming further a necessary reinforcement which facilitates a reliable elastic suction seat during engagement of the inner rim surface of the rear piece 20 with respect to tight-fitting parts 23 and welt 24, on the one hand and surface 23a and annular groove 24a on the other hand.

It can thus be seen that there has been provided according to this invention an ampulla-like device forming a small package for being discarded after use, if desired, and comprising an elongated tubular front piece made from relatively inelastic synthetic rubber composition and shaped for the insertion into a hollow of a human body, said front piece being provided with an enlargement end piece, a rear piece made from an elastic rubber

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composition and shaped for the reception of a substance to be dispensed through said front piece, said rear piece forming a squeezable hollow body provided with a reinforced end flange, and respective complementary or interengageable means on said enlargement end piece and on said end flange, and adapted to tightly fit one another and for removal from each other.

Said interengageable means include cylindrical surface portions for intimate and abutting contact with each other, and a circular welt positioned on one of said cylindrical surfaces and engageable with a correspondingly shaped groove recessed in the other of said cylindrical surfaces, said reinforced end flange and said enlargement end piece being each provided with a curved outer surface part substantially in alignment with each other in assembled condition of said ampulla structure, thereby forming a rearwardly curved shield piece on the latter, said interengageable means being engageable with each other upon pressure exerted from said enlargement end piece against said end flange.

It will be further noted that said interengageable means extend in perpendicular direction to the respective cylindrical surface portions which extend parallel to the longitudinal axis of said front piece and of said rear piece.

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claim.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

A disposable plastic ampulla construction comprising a hollow front member having a substantially cylindrical outer surface terminating in an upwardly and outwardly flaring end portion, said end portion being provided with a cylindrical contact face and with an annular welt located rearwardly of and upwardly beyond said cylindrical contact face, a cylindrical and elongated rear member terminating in an end portion having an upwardly and outwardly directed flange terminating in a free outermost end edge extending beyond said end portion of said front member and projecting with said free end toward said rear member, said end portion of said rear member including a recess and a cylindrical contact face forwardly of said recess in tight fitting engagement with said welt and said cylindrical contact face of said front member respectively, the front face of said flange being substantially aligned with the corresponding outer surface of said flaring end portion of said front member to thereby form a shield-shaped prolongation of the latter for protecting the fingers of an operator when squeezing said cylindrical rear member in cross-wise direction of its longitudinal axis to discharge the contents therefrom through an opening in said front member.

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