The present invention provides a multi-compartment ampoule for the storage of the separated components of a multiple component mixture and then mixing them together in a single ampoule. The ampoule housing has a proximal dispensing end. The distal end of the ampoule housing is sealed by an end plug configured with an axial through bore. A portion of an axially displaceable plunger element passes Through the axial Through bore and extends into the interior volume and is fixedly Attached to an axially displaceable piston element slideably deployed within the ampoule housing so as to sealingly divide the interior volume into at least first and second storage regions that are pre-filled with the separate components that will be mixed together just prior to use. Axial displacement of the plunger element, and thereby the piston element, in a first direction discharges a first component of the mixture from the distal storage region through a one-way flow configuration into the proximal storage region. After the two components are in a single storage region, they may be thoroughly mixed together. Once the components are mixed, dispensing of the mixture may be by any number of methods. The mixture may be dispensed as if from a standard ampoule, wherein the needle of a syringe is inserted through the sealing membrane and the prescribed amount of the mixture is drawn out. Alternatively, the ampoule may be inserted into an injection device, such as an injection pen for example, in a manner similar to a standard ampoule. The additional features of a needle cannula configured for attachment directly to the proximal dispensing end of the ampoule housing and graduated markings on the shaft of the plunger that are indicative of volume dispensation combined with the basic ampoule provides an embodiment that can store the separated components of the mixture before use, provide a way of mixing the components together in the same ampoule and that can be used as the syringe to dispense the mixture directly into the patient.

**FIG. 1**

**Abstract:** The present invention provides a multi-compartment ampoule for the storage of the separated components of a multiple component mixture and then mixing them together in a single ampoule. The ampoule housing has a proximal dispensing end. The distal end of the ampoule housing is sealed by an end plug configured with an axial through bore. A portion of an axially displaceable plunger element passes thorough the axial through bore and extends into the interior volume and is fixedly attached to an axially displaceable piston element slideably deployed within the ampoule housing so as to sealingly divide the interior volume into at least first and second storage regions that are pre-filled with the separate components that will be mixed together just prior to use. Axial displacement of the plunger element, and thereby the piston element, in a first direction discharges a first component of the mixture from the distal storage region through a one-way flow configuration into the proximal storage region. After the two components are in a single storage region, they may be thoroughly mixed together. Once the components are mixed, dispensing of the mixture may be by any number of methods. The mixture may be dispensed as if from a standard ampoule, wherein the needle of a syringe is inserted through the sealing membrane and the prescribed amount of the mixture is drawn out. Alternatively, the ampoule may be inserted into an injection device, such as an injection pen for example, in a manner similar to a standard ampoule. The additional features of a needle cannula configured for attachment directly to the proximal dispensing end of the ampoule housing and graduated markings on the shaft of the plunger that are indicative of volume dispensation combined with the basic ampoule provides an embodiment that can store the separated components of the mixture before use, provide a way of mixing the components together in the same ampoule and that can be used as the syringe to dispense the mixture directly into the patient.
INTERNATIONAL SEARCH REPORT

International application No. PCT/IL07/00987

A. CLASSIFICATION OF SUBJECT MATTER
IPC: A61M 37/00 (2006.01)
USPC: 604/82

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 604/82-85, 89.92

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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<tbody>
<tr>
<td><strong>Y</strong></td>
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<tr>
<td><strong>Y</strong></td>
<td>U.S. 6,419,656 (Vetter et al.) 16 July 2002 (16.07.2002), Col. 2 lines 1-65</td>
<td>6, 8, 11, 18, 20</td>
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</tbody>
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Further documents are listed in the continuation of Box C. See patent family annex.

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Date of the actual completion of the international search: 03 June 2008 (03.06.2008)
Date of the international search report: 05 July 2008 (05.07.2008)

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