

## UNITED STATES PATENT OFFICE

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## FLEXIBLE VEHICLE

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The present invention relates to the manufacture of flexible elastic sheet or vehicle specifically for the purpose of carrying or sustaining various medicinal preparations although it may have a broader utility. It is one object and purpose of the invention to produce an elastic medium which is self supporting, having sufficient body and cohesiveness so that it requires no reinforcement or backing material in order that it may hold together. The vehicle has the property, however, that in the presence of moisture and at body temperature, it will melt, thus releasing any medicament which is incorporated therein. The material, therefore, makes an excellent antiseptic dressing for it can be applied directly to wounds or burns, and when held in contact with the flesh, it will gradually melt away irrigating the wound and causing rapid and effective healing. The presence of antiseptics within the vehicle assures clean and rapid healing.

The vehicle is elastic and has a very substantial tensile strength so that it can be handled in sheet form or made up as a finger cot or pouch, and resembles a fine rubber sheeting such as made of pale crepe rubber. It is limp and flexible and has a soft, yielding, non-tacky texture which makes it suitable for a wide variety of uses.

The perfection of the elastic, meltable vehicle of sufficient tensile strength for the purposes set forth has been the result of numerous experiments and developments, being shown and described in my copending applications Serial No. 543,494, filed June 10, 1931, and Serial No. 596,901, filed March 4, 1932 of which the present application is a continuation of the subject matter common thereto.

One method of procedure for securing the elastic, self-supporting vehicle or medium is set out below, it being understood, however, that exact conformity with the proportions and order of steps is not necessary. Having pointed out the essential features of the invention, it is possible for those skilled in this art to make modifications or changes therein without departing from the invention as set forth and claimed herein.

As an example, therefore, the following will give a satisfactory product having the new and useful properties set forth.

To 537½ grs. of gelatine, preferably what is known in the trade as a "sparkling" gelatine, is added 3 ozs. of distilled water which is sufficient to soften the gelatine to approximately the consistency of soft mush. One and one-half ounces of chemically pure glycerine is added to the gela-

tine and thoroughly mixed. To this mixture is added 80 minims of pure castor oil and thoroughly mixed. The mixture of water, gelatine, glycerine and castor oil is boiled until substantially all the water has evaporated and the mass is of the consistency of a high grade engine oil or a very thick maple syrup. It is essential that substantially all of the water be eliminated in the boiling operation for otherwise the resultant product will not age properly, but will become tough and will lose its flexibility and softness of texture. The vehicle is inert with respect to the medicaments employed.

During the process, the desired medicaments may be added, the point at which the addition is made being largely dictated by the character and properties of the medicament, for if the medicament is affected at the temperature of boiling, it should be added at the end of the boiling operation. With the formula and proportions which have been given, a medicament of boric acid, lactic acid and oxyquinoline sulphate may be employed. Where an oily medicament is employed, such, for example, as ichthyol, the percentage of glycerine is increased in order to balance properly with the oily content of the mixture.

It is also possible to omit the oil if only certain of the properties, such as high tensile strength, non-friability and elongation, are desired. It is also possible to substitute other oils for the castor oil designated. It has been found that cottonseed oil gives fair results, and other oils have been used. Vegetable oils give the most satisfactory results, but it is not intended to limit the invention to the addition of any particular oil, where others may be used.

The oils which can be used as substitutes for the castor oil are known by the general designation of fixed oils and include animal oils as well as vegetable oils. The oils which have been employed by me with success are fixed oils with specific gravities ranging from 0.870 to 0.985 at 25° C. As other alternative vegetable oils almond oil and olive oil have been employed, but when these oils or cottonseed oil are employed it is advisable to increase the quantity of oil over that required when castor oil is employed. For example, with cottonseed oil about 120 minims would be required in the formula set out above and approximately the same proportions of the substitute vegetable oils. Codliver oil has also been found satisfactory in certain respects. Animal oils such as skunk oil and lard oil give excellent results, and other oils of animal origin may be

employed. I have found that practically all vegetable and animal oils work in varying degrees, and it is not my intention to be limited to any of the oils specifically mentioned as others  
5 may be found. I have tried mineral oils and volatile oils but these do not properly combine with the other ingredients. This is possibly due to the fact that the animal and vegetable oils react with the gelatine in the proper manner  
10 whereas mineral oils will not.

After the boiling operation is completed, the substance may be formed into sheets, wrappers, pouches, or cots by any known means. It may be spread over sheets of glass or the like and allowed to congeal in sheet form or forms  
15 may be dipped therein. The resultant vehicle will be formed in accordance with its method of treatment in any desired shape upon cooling and it may be desirable to form it into pencils, cones,  
20 bougies or the like, and may be molded into shape as found desirable. After completion the articles are dusted with lycopodium powder and are then ready for use, the ultimate purpose for which said articles are to be used being determined by the medicament incorporated there-  
25 in.

While the product has particular and peculiar advantages for the specific purpose set forth, it is possible that it may be employed in wider and varied fields, and for this reason the invention  
30 is not strictly limited to the medicinal field.

What is claimed is:

1. A vehicle for the purpose of holding medicaments and releasing them when used as a bandage  
35 about the body or for similar purposes, comprising a soft, non-friable, flexible, elastic substance, said vehicle being composed of a water solution of gelatine and glycerine which have been boiled together until the water is substantially eliminated therefrom.  
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2. A vehicle for the purpose of holding medicaments and releasing them when used as a bandage  
45 about the body or for similar purposes, comprising a soft, non-friable, flexible, elastic substance of high tensile strength, said vehicle being composed of gelatine, glycerine and castor oil.

3. A vehicle for the purpose of holding medicaments and releasing them when used as a bandage  
50 about the body or for similar purposes, comprising a soft, non-friable, flexible, elastic substance of high tensile strength, said vehicle being composed of gelatine, glycerine and a heavy viscous vegetable oil.

4. A vehicle, for use in the application of  
55 medicaments to the human body, which is soft, non-friable, elastic, flexible, pliable and non-tacky at room temperatures so that it may be handled, cut and applied without the incorporation therewith of any backing or reinforcing material, and which will melt at the temperature of  
60 the body in the presence of moisture, said vehicle comprising gelatine and glycerine in an anhydrous state.

5. The process of manufacturing a vehicle  
65 such as described in the preceding claim hereof,

comprising forming a solution of gelatine, glycerine and a heavy viscous fixed oil, and boiling the same until the water is substantially eliminated and it becomes a homogeneous syrupy liquid, and then forming the same into a sheet  
5 or membrane.

6. A vehicle, for use in the application of medicaments to the human body, which is soft, non-friable, elastic flexible, pliable and non-tacky at room temperatures and has high tensile strength  
10 so that it may be handled, cut and applied under tension without the addition of any backing or reinforcing material and will melt at the temperature of the body in the presence of moisture and which will not dry out or become stiff upon  
15 exposure to the air, comprising glycerine, gelatine and a viscous fixed oil.

7. The process of manufacturing a vehicle such as described in the next preceding claim hereof,  
20 comprising forming a water solution of gelatine, glycerine and a viscous vegetable oil and boiling the same until the water is evaporated therefrom, and then forming the same into a sheet or membrane.

8. The process of manufacturing a vehicle such  
25 as described in the second preceding claim hereof, comprising forming a water solution of gelatine, glycerine and castor oil and boiling the same until the water is evaporated therefrom, and then forming the same into a sheet or mem-  
30 brane.

9. A bandage for treating wounds or for application to the human body, comprising a membrane of high tensile strength and elasticity to be self-sustaining at ordinary atmospheric tem-  
35 peratures composed of gelatine, glycerine and a viscous vegetable oil in an intimate mixture without water, said membrane having a medicament contained therein and having a melting point in the presence of moisture at the temperature of  
40 the body.

10. A flexible, elastic vehicle for the uses and purposes set forth, which is soft, non-friable, pliable and non-tacky at room temperatures, and has sufficient tensile strength so that it may be  
45 handled, cut and used without the incorporation therewith of any backing or reinforcing material, comprising an anhydrous solution of gelatine, glycerine and a fixed oil having a specific gravity between the limits of 0.870 and 0.985 at 25° C.  
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11. The process of manufacturing a vehicle with the properties described in claim 10 comprising forming a solution of gelatine, glycerine and a fixed oil and boiling the same until it becomes a homogeneous syrupy liquid and then  
55 forming the same into a sheet or membrane.

12. The process of manufacturing a vehicle having the characteristics set forth comprising forming a water solution of gelatine, glycerine and a fixed oil which will combine therewith,  
60 boiling the solution until the water is substantially evaporated therefrom and then forming the same into a sheet or membrane.

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