

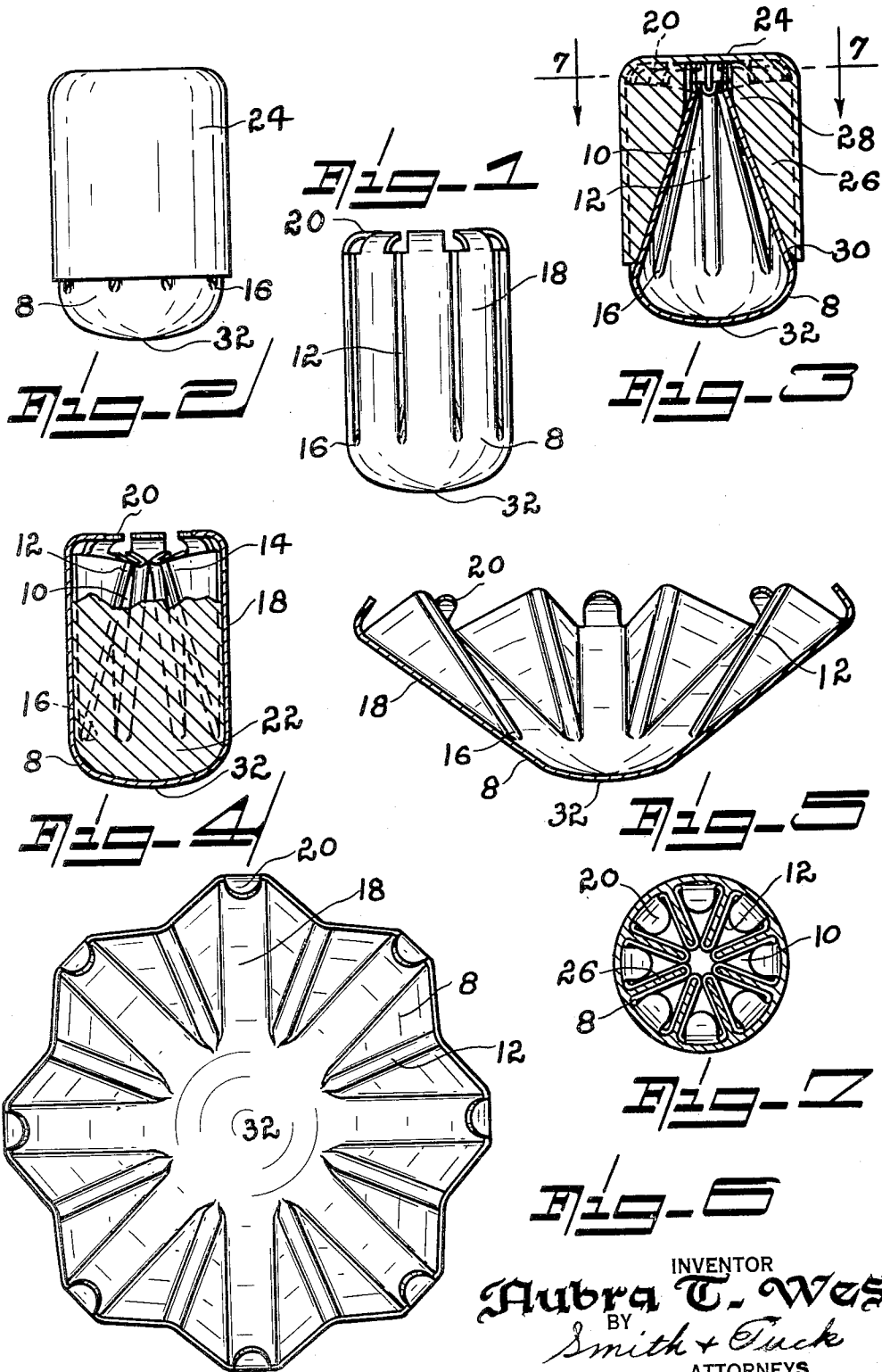
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A. T. WEST

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EXPANDING CAPSULE BODY

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INVENTOR
Hubert T. West
BY
Smith & Tuck
ATTORNEYS

UNITED STATES PATENT OFFICE

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EXPANDING CAPSULE BODY

Aubra T. West, Seattle, Wash.

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5 Claims. (Cl. 128—272)

My present invention relates to capsule making and more particularly to an expanding capsule body.

Capsules have normally been spherical envelopes of digestible materials in which nauseous or acid doses are inclosed for the purpose of swallowing the same. My present capsule however is for an entirely different purpose. It is intended to be introduced into natural or artificial cavities of the body to arrest hemorrhage, to absorb secretions or to hold medicaments in place for limited periods for the treatment of various diseases. It is preferred that the capsule be made of material which will, in the course of a few hours time, gradually be dissolved so that there will be no irritation of infected parts of the body nor any danger of breaking a blood clot once formed, occasioned by the removal of the same.

The principal object of my present invention is to provide a capsule for the treatment of hemorrhage and disease or for the absorption of unwanted secretions which occur in natural cavities of the body or from wounds produced in the body.

A further object of my invention is to provide a capsule the body of which, because of its peculiar folded construction, will expand and tend to take a disc like form so as to more fully and completely seal a cavity.

A further object of my capsule is to provide the same with tabs on the upper surface thereof which may fold outwardly and more effectively seal a jagged wound or seal the fold of tissue.

A further object of my invention is to provide a cover for the capsule body which is so arranged as to prevent the various folds of the capsule from adhering one to the other so as to defeat the intended purpose of the capsule body.

Other and more specific objects will be apparent from the following description taken in connection with the accompanying drawing, wherein

Figure 1 is an elevation of a capsule made after the teachings of my principle.

Figure 2 is an elevation of my capsule with its cover in place.

Figure 3 is a vertical sectional view taken as tho thru the longitudinal axis of my capsule with its cover in place after the showing of Figure 2.

Figure 4 is a vertical sectional view in the same general sense as Figure 1.

Figure 5 is a cross sectional view of my capsule partly unfolded.

Figure 6 is a top plan view of a capsule in the same condition as shown in Figure 5.

Figure 7 is a cross sectional view taken along the line 7—7 of Figure 3.

Referring to the drawing, throughout which like reference characters indicate like parts, 8 designates the body portion of my capsule. This is normally formed of a softer shaped disc of gelatinous material which is crimped or folded after the showing of the various figures so as to provide a cylindrical portion having a curved bottom and in effect a slightly curved upper wall portion. To obtain this cylindrical construction I have found it desirable to provide a multiplicity of crimps or folds in the form of V-shaped indentations. The exact form of these will probably best be observed from Figures 3, 4 and 7 in that the excess material is forced in towards the center of the capsule, thus providing at the upper end of the capsule a plurality of V-shaped indentations 10. These are formed by having two adjacent folds pressed towards the center so that the folds themselves as 12 are radially disposed.

In turning out this folding principle it of course will be apparent that there is a great excess of material near the periphery of the saucer shaped disc. This when the folding is completed results in the indentation 12 being of maximum extent at their upper portion as indicated at 14 in Figure 4 and running out entirely at the lower margin as at 16. This feature is particularly helpful in that it enables the complete filling of the capsule with a medicament by merely inserting a discharge tube down near the bottom of the capsule, then the medicament will flow upwardly between the folds of material until the capsule is entirely filled.

As this capsule is intended for insertion into a wound or natural cavity of the body with the protective cover removed it has been found highly desirable to have the upper margin of the body portion 8 in effect curved inwardly to the end that there will be no corners which might tend to make the insertion of a capsule more difficult or to irritate a wound or infected area. This effect is accomplished by having each portion of the folds which still retain the cylindrical form, as for instance 18, provided at their upper margin with a tab as 20. These tabs are then disposed to turn inwardly and in effect produce a rounding upper edge for the capsule. This construction is best shown possibly in Figures 1, 4 and 7.

As it is intended that the capsules shall normally be filled with a medicament as 22, it is desirable that it be protected from contamination until the time of use has arrived. To ac-

comply with this I provide the cover 24 formed possibly of the same material as the body portion but most preferably of a material which is less apt to be affected by an increased temperature or humidity. This upper portion might preferably be made of treated paper or at least a gelatine of different temper from the body portion to the end that it would not unite or bond with the gelatinous material of the lower body portion 8. In addition to sealing the end of the medicament container 8, the cover has the additional function of separating the various folds of the body portion so that they will not stick to each other and thus be slow in unfolding or not unfold at all and thus enabling the capsule to serve its primary function of closing entirely the passage into which it is passed. It is believed that best results from a cover will be obtained either by folding a flat sheet or molding the same so that in effect a plurality of inwardly extending fins 26 are provided. These should be radially disposed and match up exactly with the capsule, that is one inwardly extending fin for each of the folds of the capsule. It will then naturally follow that the fins will have their greatest extent at the bottom or closed end of the cover after the showing of Figure 3 in which the fins 26 have their greatest extent at 28 and run out entirely at 30. This construction is probably best illustrated in Figure 7 in which it will be observed that none of the gelatin folds touch each other except possibly just at one point. It is then apparent that when the cover 24 is removed each of the various folds are certain not to be bonded to each other and in this way the quickest unfolding possible of the capsules should result.

Method of use

Capsules made according to my principles should of necessity be made small enough to easily enter the expected cavity or passage. For treatment of the nasal passages for instance, the capsule would be about the size of a lead pencil. This same size capsule or possibly smaller would be used in treatment of a gun shot wound, for instance, where it is desirable to place a medicament well into the wound and then as the heat of the body dissolves the capsule, natural muscular movement of the flesh will gradually cause the medicament to be expelled from the wound and thus completely immunize the entire area.

In the treatment of the nose, particularly for colds, it is desirable that the medicament be retained at the upper portion of the nasal fossæ. In cases where menthol or eucalyptus are used it is desired to retain this well up in the passage yet it is very desirable that while the patient sleeps the entire capsule should disintegrate and free the passages for normal breathing.

When made in appropriate sizes this capsule can also be used for the treatment of diseases in the urethra, vagina, or rectum.

In preparing the capsule for use the cover 24 of course must be removed. This can best be accomplished by revolving the cap a small amount in both directions so as to sort of break loose the fin 26 from the fold 12. Then the cover can be removed by pulling it straight off the open end of the capsule.

The capsule is inserted in the cavity with the open end leading and pressed up to the

point it is desired to treat. Then the heat of the body tends to unfold the crimped or folded edges of body 8 and it tends to return its original and natural position, that of a disc. However, inasmuch as the capsule should be formed from a disc considerably larger than the opening to be treated, the disc can never quite unfold but will remain in the saucer or cup form shown in Figures 5 and 6.

As the capsule is unfolded it has been found that the upwardly extending tab 20 will tend to uncurl and straighten out in a prolongation of saucer like sides and will provide means for sealing off any irregularities of the passage under treatment. These might be folds in the tissues or it might be jagged cuts in the flesh such as would be encountered in the treatment of wounds. This has been found to aid materially in the securing of this device in proper position and maintaining it there. Another item that has been found to aid considerably in the retention of the device for considerable periods is to have that portion of the fold which forms the cylindrical surface of the capsule as indicated at 18 and tab 20 formed of somewhat thicker material than the folded portion 12. This can easily be arranged for in the manufacture if the material is molded which is a very convenient way of handling the gelatinous materials. When so arranged the portions 18 together with the increased weight of tabs 20 provide a sort of frame work or structure upon which the thinner membrane rests until it is entirely decomposed or dissolved.

It has further been found that, with the tabs 20 curved over as indicated in Figures 1 and 4, if the device after being put in position is given longitudinal pressure as for instance if a pressure being applied to the extreme bottom portion 32 there will be a tendency to expand the cylindrical extent and a tendency to expell the medicament 22 out of the capsule. As this expelled material impinges upon the curved tabs 20 it will tend to further accelerate the opening of the capsule to the desired saucer-like form.

The foregoing description and the accompanying drawing are believed to clearly disclose a preferred embodiment of my invention but it will be understood that this disclosure is merely illustrative and that such changes in the invention may be made as are fairly within the scope and spirit of the following claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A medicated capsule of soluble material having a number of spaced inner longitudinally extending folds tapering from one open end to the other closed end of the capsule.
2. An openable capsule of soluble material having an open end and a closed rounded head, a number of spaced longitudinally extending inner folds in the wall of the capsule, said folds tapering from the open end toward the closed head, and inwardly turned end-tabs on said wall located between adjoining folds.
3. An openable capsule having an open end and a closed head, a number of spaced longitudinally extending inner folds in the wall of the capsule, a cap-over adapted to cover the open end of the capsule, and interior fins on said cap-cover adapted to fit within the complementary folds of the capsule.
4. An openable capsule having an open end and a closed head, a number of spaced longitudinally

extending inner folds in the wall of the capsule, said folds tapering from the open end toward said head, a cover for the capsule, and interior fins on said cover complementary to and fitted in said folds. 5 folds. 80

5. An openable capsule of soluble material having an open end and a closed rounded head, a number of spaced longitudinally extending inner

folds in the wall of the capsule, inwardly turned end-tabs on the wall between adjoining folds, said folds tapering from the open end toward the rounded head of the capsule, a cover for the capsule, and interior fins on said cover complementary to and fitted in said folds.

AUBRA T. WEST.

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