UNITED STATES PATENT OFFICE.

BENJAMIN F. LYFORD, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN EMBALMING.

Specification forming part of Letters Patent No. **111,222**, dated January 24, 1871.

To all whom it may concern:

Be it known that I, Dr. BENJAMIN F. LYFORD, of San Francisco, in the county of San Francisco and State of California, have invented a new and Improved Solution and Process for Embalming; and I do hereby declare the following to be a full, clear, and exact description of the same.

The proper distillatory apparatus having been prepared; the manner of proceeding in order to obtain the embalming material is as follows: Take of nitrate of potassa, in powder, one equivalent, and add of *carbo ligni pulvis* a sufficient quantity to well divide the particle of potassa by trituration. Place this mixture within the distillatory apparatus, and by means of a funnel add of monohydrated sulphuric acid two equivalents. Adapt the proper receiver and apply heat, moderate at first and gradually increased as the material within thickens, until the whole is in a state of perfect fusion. Continue this distillation until one equivalent of monohydrated nitric acid is obtained, which place in open retorts, and thereto carefully add pure granulated metallic zinc until hydrogen is no longer disengaged. The reason for disengaging all the hydrogen possible from this solution is to enable it to reabsorb hydrogen when diffused throughout the subject that is to be embalmed. To the nitrate solution, in order to prevent crystallization, immediately add one equivalent of anhydrous alcohol, mix well, transfer the solution to bottles, which stop tightly, and allow it to stand therein for several days. To thirty-two ounces of this fluid add two ounces of creosote, which imparts a fine, rich color, much resembling that of blood. The liquid is now ready for use.

The process of embalming is as follows: If death has resulted from a wound, or from a disease that has not injured the muscular structure of the arteries, make an incision into and expose the right femoral artery. Make an opening four inches below the branch of the profunda, and in this opening place and properly secure a tube three-sixteenths of an inch in diameter, to which fasten one end of a flexible pipe, the other end of which is constructed with a stop-cock so arranged that it can be easily attached to a reversible pump. Then place the subject in a receptacle having a strong glass top, and otherwise so constructed that the cover may be secured air-tight, through the side of which receptacle the injection-pipe passes, and also a separatue tube provided with a stop-cock, to which tube the pump is now attached, and by means of the pump a vacuum as nearly perfect as possible is formed within the receptacle. Turn the cock, detach and reverse the pump, connect it with the flexible injection-tube, and force into the arteries the liquid whose composition is above described until tears are freely driven from the subject's eyes and small white elevations appear in all parts of the surface of the body. Close the cock of the injection-tube, and allow the subject thus to remain for the space of twelve hours, after which reverse the pump, open the cock, and withdraw from the subject all the solution possible with the use of twice the force with which the injection was accompanied. This process of alternate injection and exhaustion should be repeated from one to six times, or even more, according to the amount of muscle to be acted upon, each injection subsequent to the first to be withdrawn after four or six hours' standing. This completed, the receptacle should be opened. Now make an incision from the center and upper part of the sternum downward along the line of the linæ alba, dividing the muscles and peritoneum. Dissect back the muscles over the thoracic region, cut through the cartilages, and elevate the sternum. Next carefully remove the entire viscera, sponge out the abdomino-parietal cavity, remove the injection-tube, again readjust the lid of the receptacle, and once more exhaust the air within it. The subject should remain *in vacuo* until the solution ceases to accumulate within the abdominal cavity. Then open the receptacle, sponge out the cavity, and apply arsenic plentifully over its inner surface. Next fill the cavity with *carbo ligni pulvis* and *Quercus alba pulvis*, well mixed, readjust the sternum, secure by suture, and close up the incision. Open the eyes, make an incision through each sclerotic one-eighth of an inch above the upper margin of the iris, evacuate the humors, carefully wipe out the ball, place within it a small amount of arsenic, fill the ball with cotton, and place over it an artificial eye. Scatter arsenic in powder over the body, and ap-

ply bandages under the clothes or on those portions of the body not in sight. Color the lips, cheeks, and other parts of the face to life, and place the body in a dry room within a casket, or other covering that will exclude moisture, until the body becomes hard. Subjects thus prepared are perfect in color and form, and at the distance of a few feet they look as though alive. They remain for years in the exact condition in which the embalmer leaves them.

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

1. The solution for embalming, composed of the ingredients herein described.

2. The process of compounding said solution, as set forth.

3. The process of embalming, as herein specified.

B. F. LYFORD, M. D.

Witnesses:

SOLON C. KEMON,

CHAS. A. PETTIT.