

# UNITED STATES PATENT OFFICE.

FRANK A. HOWIG, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO HIMSELF,  
FRANK B. H. WING, AND RANDOLPH F. RADEBAUGH, OF SAME PLACE.

## IMPROVEMENT IN PRODUCTION OF WOODEN BOTTLE-STOPPERS AND BUNGS.

Specification forming part of Letters Patent No. **197,220**, dated November 20, 1877; application filed July 23, 1877.

*To all whom it may concern:*

Be it known that I, FRANK A. HOWIG, of the city of San Francisco, county of San Francisco, and State of California, have invented a new and Improved Process of Manufacturing Wooden Bottle-Stoppers and Bungs; and do hereby declare that the following is a full and complete description of the process of manufacture.

The wood is subjected to chemical action, and the following are the several steps of the process:

First, the wood is cut into the desired form for stoppers or bungs, which may be done by machinery at comparative insignificant cost.

Second, the stoppers or bungs so prepared are immersed in a strong cold solution of potash, and there allowed to remain until they have become thoroughly saturated with the fluid, when they are removed. By this means they are rendered compressible, with slight force, and elastic.

Third, they are then subjected to the action of boiling water or steam to remove the contained potash.

Fourth, they are then immersed in glycerine and water, of equal parts, or one part of the former to two of the latter, or glycerine and milk in these proportions, heated nearly or about to the boiling-point, and there allowed to remain until thoroughly permeated by the mixture, the time varying according to the size of the stopper or bung.

Fifth, when removed from this mixture, the ducts of the wood being well filled therewith, the stoppers or bungs are subjected to a moderate degree of heat, in order to expel the watery portion of the mixture from them.

Sixth, the stoppers or bungs are then immersed in either bees-wax or paraffine, rendered

fluid by heat, for from one to two hours or more.

Seventh, the stoppers or bungs are then put into a drum with clean sand, and shaken, so as to remove from their surface the adhering wax or paraffine.

After these various steps are gone through with, there results a product which answers all the requirements of a bottle-stopper or bung, and may be produced at much less cost than the ordinary stoppers of bark. They are stronger and of better appearance than the bark stoppers, and more elastic and impervious than the ordinary stopper or bungs.

I am aware that the several chemicals above specified have been heretofore used separately in the treatment of wood; but I am not aware that they have been used in combination for rendering it elastic and impervious, which is the object of my invention.

In this my process of manufacturing bottle-stoppers and bungs, I claim and desire to secure by Letters Patent—

1. A new process for treating wood for making elastic bottle-stoppers and bungs, consisting in removing the resinous and gummy matters by treatment with strong alkaline solutions, and then subjecting it to steam or hot water, and subsequent treatment with glycerine and paraffine or wax, or their equivalents, substantially as set forth.

2. Elastic wooden bottle-stoppers or bungs impervious to liquids and gases, prepared substantially in the manner and for the purpose set forth.

FRANK A. HOWIG.

Witnesses:

R. F. RADEBAUGH,  
WM. H. MEGGINS.