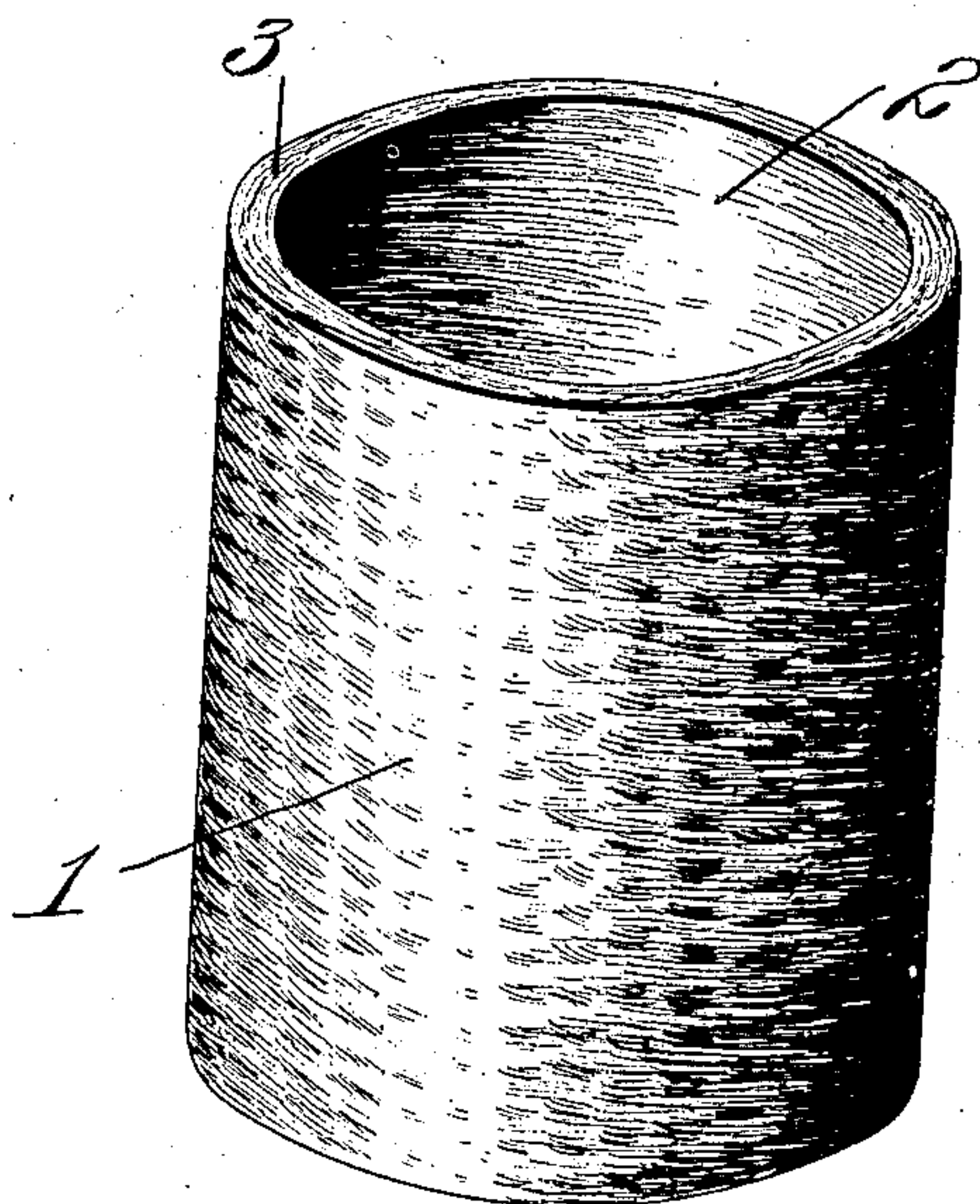


No. 768,307.

PATENTED AUG. 23, 1904.

J. H. RIVERS.  
HOLLOW PULP ARTICLE.  
APPLICATION FILED AUG. 20, 1903.

NO MODEL.



Witnesses:  
*J. H. Gibbs*  
J. H. Gibbs

Inventor:  
Julian H. Rivers,  
by Bakewell & Amwall  
attys.



# UNITED STATES PATENT OFFICE.

JULIAN H. RIVERS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO UNITED STATES FIBER STOPPER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF SOUTH DAKOTA.

## HOLLOW PULP ARTICLE.

SPECIFICATION forming part of Letters Patent No. 768,307, dated August 23, 1904.

Application filed August 20, 1903. Serial No. 170,122. (No model.)

*To all whom it may concern:*

Be it known that I, JULIAN H. RIVERS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Hollow Pulp Articles, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

This invention relates to new and useful improvements in hollow pulp articles designed for use for various purposes, such as packing for bottles, blanks for the manufacture of pulp gaskets, buckets, &c.

In the drawing I have shown in perspective a hollow pulp article possessing the characteristics of my invention, the same being shown as an open-ended cylinder; but it is obvious that one or both ends of the cylinder could be closed by inserting end pieces, if desired, or that one end can be wholly and the other partially closed integrally by making provisions for such heads or flanges in the mold; also, that the cross-sectional contour could be changed to suit the taste of the designer in adapting the article to different uses. For instance, the article could be polygonal in cross-section or non-circular, and, furthermore, the article could be tapered longitudinally or made in various shapes and forms without departing from the nature and principle of my invention.

My invention consists in a hollow pulp article wherein the fibers of the pulp lie principally in one direction—to wit, circumferentially—said fibers being arranged in superposed layers or strata and built up one upon the other until the desired thickness and density are secured. The fibers, which lie principally in circumferential direction, are also slightly oblique or helically disposed, which is advantageous in that the fibers are by this arrangement enabled to lie closer together and make a more compact article which is not so susceptible to transverse fracture. The fibers, as before stated, are stratified and lie principally in a circumferential direction, being

slightly helically disposed, and in addition to this the fibers of the different strata lie in planes of a different and opposite pitch. By this arrangement it is obvious that the crossing of the fibers results in a structure possessing characteristics partaking of the nature of a woven article, the fibers interlacing with each other in such a manner as to produce by the stratified helices of different and opposite pitch a structure which is extremely strong and durable and of such density as conditions for which it is to be used may require.

In the drawing I have shown the article as a pulp cylinder, in which 1 indicates the outer surface or periphery, and 2 the inner surface or periphery, the fibers being illustrated as being slightly helically disposed. At the end 3 a stratification is represented, the superposed layers of the opposing helices interweaving with each other, so as to make a compact integral structure in the form of a hollow seamless pulp tube.

In applications filed by me of even date herewith, Serial Nos. 170,123 and 172,121, I have shown, described, and claimed the apparatus and process for making hollow pulp articles possessing the characteristics herein set forth, and therefore I deem it unnecessary to illustrate or describe in this application any apparatus for manufacturing such an article.

I am aware that minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. An integral hollow pulp article whose fibers are longitudinally stratified and helically disposed; substantially as described.

2. An integral hollow pulp article whose fibers are helically disposed in opposite directions; substantially as described.

3. An integral hollow pulp article, composed of layers of fiber, the fibers of each layer being helically disposed and having a different pitch

from those of its adjacent layer; substantially as described.

4. An integral hollow pulp article built up of convolutions of superposed layers, fibers in each layer being helically disposed in an opposite direction from the adjacent layer; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 13th day of August, 1903.

JULIAN H. RIVERS.

Witnesses:

GEORGE BAKEWELL,  
LENORE WILSON.