

E. M. CHAFFEE, dec'd.
G. L. PORTER, Adm'r.

Tubular Seamless Hose.

No. 150,481.

Patented May 5, 1874.

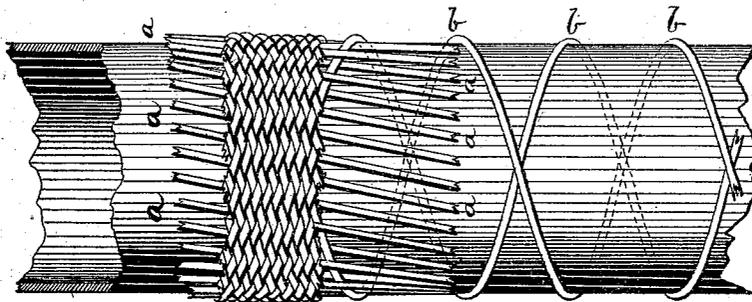


FIG. 1.

WITNESSES,

J. Knight.
Edwin C. Purce

INVENTOR,

George L. Porter
Administrator on
the Estate of Edwin
M. Chaffee deceased
per J. P. Huntington
att'y

UNITED STATES PATENT OFFICE.

GEORGE L. PORTER, OF BRIDGEPORT, CONNECTICUT, ADMINISTRATOR OF
EDWIN M. CHAFFEE, DECEASED.

IMPROVEMENT IN TUBULAR SEAMLESS HOSE.

Specification forming part of Letters Patent No. **150,481**, dated May 5, 1874; application filed
June 6, 1873.

To all whom it may concern:

Be it known that EDWIN M. CHAFFEE, late of the city and county of Providence, in the State of Rhode Island, did invent a new and Improved Tubular Seamless Hose, consisting of an improved braided fabric of fibrous material, made water-proof by lining it with india-rubber or gutta-percha and their vulcanizable or vulcanized compounds, of which the following is a specification:

The object of the invention is to make a stronger and better seamless water-proof hose in a cheaper manner by braiding than has hitherto been done by weaving. The invention herein described and claimed consists in incorporating longitudinal strands *a* in the act of braiding with the diagonal or spiral strands *b*, embraced between them where they cross or overlap each other, as seen in the drawing, Figure 1.

In the practice of the invention it has been found of value to braid or place the diagonal strands at such an angle as to insure that they shall be nearly equally strained by the lateral or bursting pressure, and the longitudinal strain or pressure upon the hose. An angle formed when a diagonal strand advances longitudinally three and two-tenth inches in making one turn diagonally, or, in other words, making a complete spiral in that distance, is near the true one, as the inventor found by experiment, when the diameter of the hose is two and three-quarter inches, and when the area of the discharge-orifice at the nozzle is equal to one square inch.

The longitudinal distance which a spiral turn should make is longer or shorter in proportion as the diameter of the hose is greater or less than the standard above given. A little expansion or contraction is admissible; yet an inconvenient expansion or contraction is liable to be produced by the pressure within the hose when any material deviation is made from the spiral angle herein indicated.

The longitudinal strands before mentioned are useful in the process of lining the hose-tube with rubber, and are also useful to resist any longitudinal strain which may occur in the absence of internal pressure.

This hose is made water-proof by lining it with vulcanizable sheet-rubber or gutta-

percha, which may be vulcanized or partially so, as well before as after it is introduced into the braided hose-tube. The lining of the hose may be accomplished by the methods patented to the said EDWIN M. CHAFFEE, October 2, 1866, or by any other feasible method.

Longitudinal strands have been introduced into flat braid before, but not into tubular fabrics for hose purposes.

The proper angle or spiral of the diagonal strands is secured by adjusting the speed of the take-up rolls of the braiding-machine, which withdraws the braided fabric from the mandrel or core, upon which it is formed or braided.

It will be obvious that the longitudinal strands may be laid in the braided fabric in a straight line, provided the spirally-laid strands cross each other on a straight instead of on a spiral line.

When the hose is braided and cut into proper lengths, care should be taken that the ends of the braid should not get raveled or frayed; and to secure that object it is advisable to dip the ends for about an inch into some adhesive substance, such as glue, shellac, or melted wax, which, when dry or cold, secures the ends of the hose or its strands from raveling.

The application of the adhesive substance may be made at the proper place before cutting the hose into lengths. By this application the ends of the hose are better fitted to be nailed or otherwise secured to rings, couplings, or head-blocks, to which force may be applied for the purpose of extending and producing tension in the hose during the process of lining, and also during the process of vulcanization.

What I claim, and desire to secure by Letters Patent as the invention of said E. M. CHAFFEE, is—

A seamless water-proof hose, the body of which is composed of braided strands and longitudinal strands, substantially as described.

GEORGE L. PORTER,

Administrator on the estate of E. M. Chaffee.

Witnesses:

THOMAS F. COSGROVE,
I. KNIGHT.