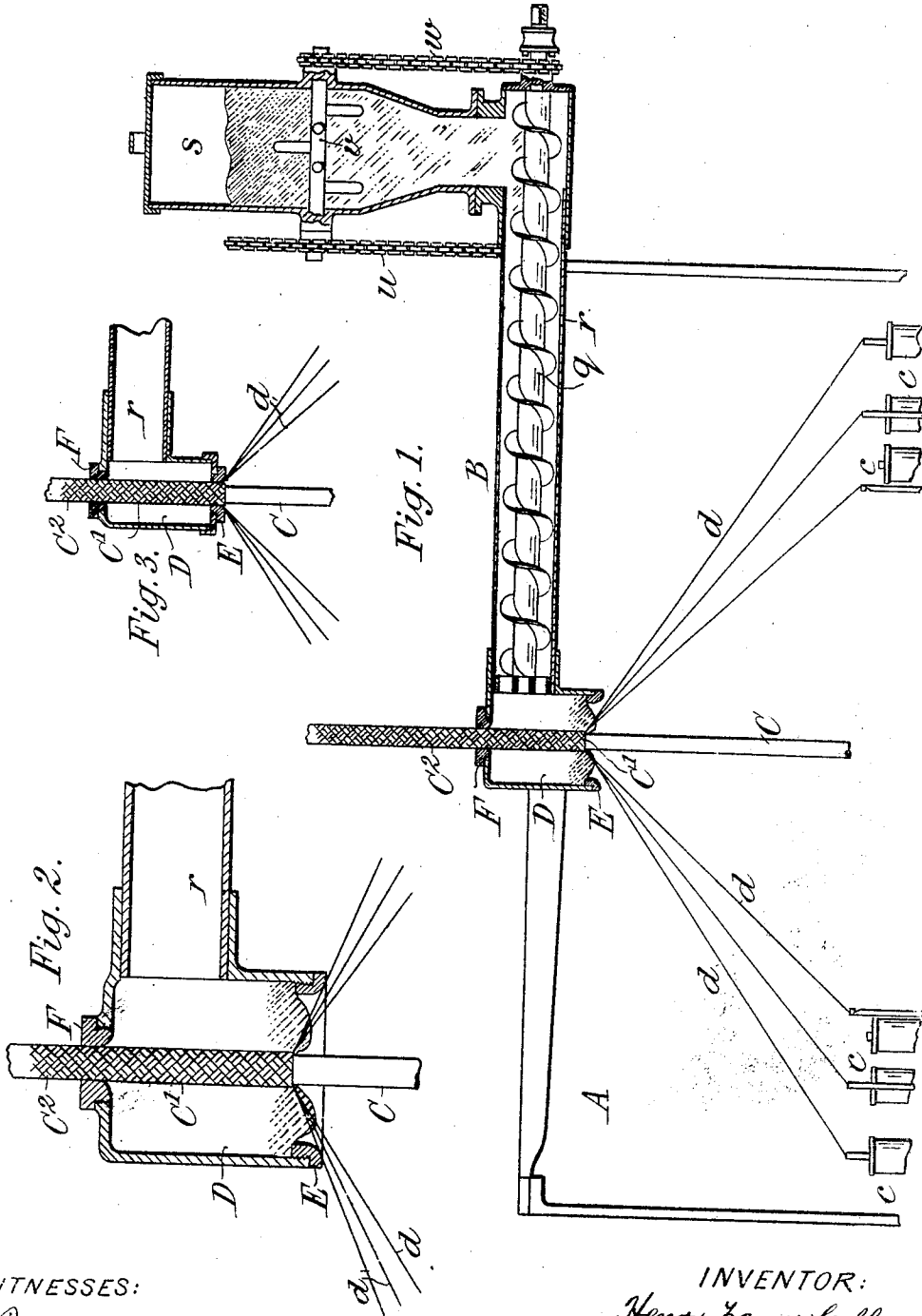


H. Z. COBB.
MANUFACTURE OF RUBBER HOSE.
APPLICATION FILED MAR. 28, 1912.

1,094,879.

Patented Apr. 28, 1914.



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UNITED STATES PATENT OFFICE.

HENRY ZENAS COBB, OF WINCHESTER, MASSACHUSETTS.

MANUFACTURE OF RUBBER HOSE

1,094,879.

Specification of Letters Patent.

Patented Apr. 28, 1914

Application filed March 28, 1912. Serial No. 686,869.

To all whom it may concern:

Be it known that I, HENRY ZENAS COBB, a citizen of the United States, residing at Winchester, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Rubber Hose, of which the following is a specification.

This invention relates to the manufacture of rubber hose, and relates to the impregnation of the fabric or textile layer or layers by means of a plastic rubber composition introduced during the operation of braiding or weaving.

The present invention is a variation or improvement upon that disclosed in my Patent No. 1,002,644 granted September 5, 1911. In that patent a coating means is provided by which a dense plastic rubber composition of the character technically known as "friction dough" is applied upon the rubber core, or upon an inner web braided or woven upon such core, after which the core or hose so coated is carried a distance sufficient to partially dry the coating, and a web is then braided upon it directly beneath a wiping die which removes the excess of coating material and banks it into a mass through which the yarns converging to form the web cut their way while approaching the braiding point. In my said patent these yarns are termed collectively the "shed," by analogy to the shed formed in weaving. My present invention differs from that disclosed in said patent in that the coating material is applied above the braiding point instead of beneath it; and is so applied that the converging yarns enter the bottom of the mass of material in the coating chamber and serve to close the bottom of such chamber. Thus instead of passing the core or hose through the coating chamber before the braided web is applied, it is passed through such chamber immediately after the braiding on of the web, so that the newly formed web is carried through the plastic material, the latter being thus caused to penetrate the mesh thereof.

My invention includes both the new process thus described, and the apparatus for performing this process.

In the accompanying drawings,—Figure 1 illustrates a fragment of a braiding machine with the addition thereto of the coating means, the view being a vertical mid-

section; Fig. 2 is a section on a larger scale showing the lower part of the coating chamber with its bottom die; Fig. 3 is a similar section showing a modified construction.

Referring to Fig. 1, A designates as a whole the braiding machine, and B designates as a whole the coating means. The braiding machine being well known, is not illustrated in detail, and requires no description other than to state that *c c* are the bobbins and *d d* the yarns proceeding therefrom and converging at the braiding point where they are braided around the core C to form the web C' of the finished hose C².

The coating means is shown as comprising a coating chamber D, to which the rubber composition or "friction dough" is fed under suitable pressure in any convenient way, this chamber being located directly above the braiding point, and having a lower die E and an upper die F. The lower die may be a fairly close fit with the hose as shown in Fig. 3; but preferably it is much larger than the hose, as shown in Figs. 1 and 2, so that it permits the coating material to gravitate into contact with the yarns *d d*, whereby the material impregnates these yarns before they unite to form the braided web, and the yarns partially cut their way through the coating material just before they thus unite. The material requires to be fed into the chamber D just fast enough to supply the required amount for coating, and not so fast as to cause the material to exude downwardly beneath the yarns *d d*. Such gravitating movement beneath the converging yarns is prevented by the travel of the yarns, which are continually moving upwardly and centrally, and which form a traveling net-work carrying the dough with them and preventing it from working down beneath them, if only the feed be properly regulated.

The hose with its newly formed web ascends through the chamber D, being surrounded by the plastic material which thus penetrates the mesh of the web. At the top of the chamber the hose draws through the die F, which is made a close fit with it, so that it acts as a wiper die and removes all coating material exterior to the web, leaving only that which impregnates the yarns and which has penetrated the interstices of the web.

For feeding the coating material to the coating chamber, I have shown the same

feeding means as that shown in my aforesaid patent. It comprises a hopper *s* containing a stirrer *v* and discharging into a conveyer tube *r* in which is a screw conveyer *q* which propels the plastic material toward the chamber *D*. The rate of feed is governed by determining the speed of rotation of its propeller screw, which is driven by a chain *w* from a sprocket on the stirrer shaft *v*, the latter being driven by a chain *u* from any suitable part of the braiding machine.

With the arrangement shown in Fig. 3 the lower die *E* has an opening only large enough to freely admit the newly braided web, being thus located entirely above the yarns *d*. Hence there is no preliminary impregnation of the yarns before they unite to form the web, the entire impregnating effect being due to the penetration of the web by the plastic material within the chamber *D*.

My invention may be otherwise modified without departing from its essential features, which are set forth in the claims.

My invention is not limited to the braiding or weaving of a web upon a rubber core *C*, as it may be applied in connection with any tubular textile web whether braided or woven.

I claim as my invention:—

1. The process of making hose which consists in forming an ascending tubular textile web, while introducing a dense plastic material around the newly-formed web above and in contact with the converging yarns at such rate as to penetrate the mesh thereof.

2. The process of making hose which consists in forming an ascending tubular textile web, while introducing a dense plastic material around the exterior of the newly-formed web to penetrate the mesh thereof, and into contact with the converging yarns, and re-

moving an excess of such material from the web.

3. An apparatus for making hose, comprising means for forming a tubular textile web, and means for introducing a plastic material around the newly-formed web comprising a coating chamber and means for forcing the material therinto under pressure.

4. An apparatus for making hose, comprising means for forming a tubular textile web and feeding it upwardly as formed, and means for introducing a plastic material directly above the converging yarns adapted to permit the material to gravitate into the yarns.

5. An apparatus for making hose, comprising means for forming a tubular textile web and feeding it upwardly as formed, and means for introducing a plastic material directly above the converging yarns, comprising a coating chamber having a bottom opening large enough to admit the web, and having a top wiper die and means for forcing the material into said chamber.

6. An apparatus for making hose, comprising means for forming a tubular textile web and feeding it upwardly as formed, and means for introducing a plastic material directly above the converging yarns, comprising a coating chamber having a bottom opening materially larger than the web arranged to be entered by the converging yarns, a top wiper die, and means for forcing the material into said chamber.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

HENRY ZENAS COBB.

Witnesses:

FRANK J. WESTWOOD,
EDWIN L. STICKNEY.