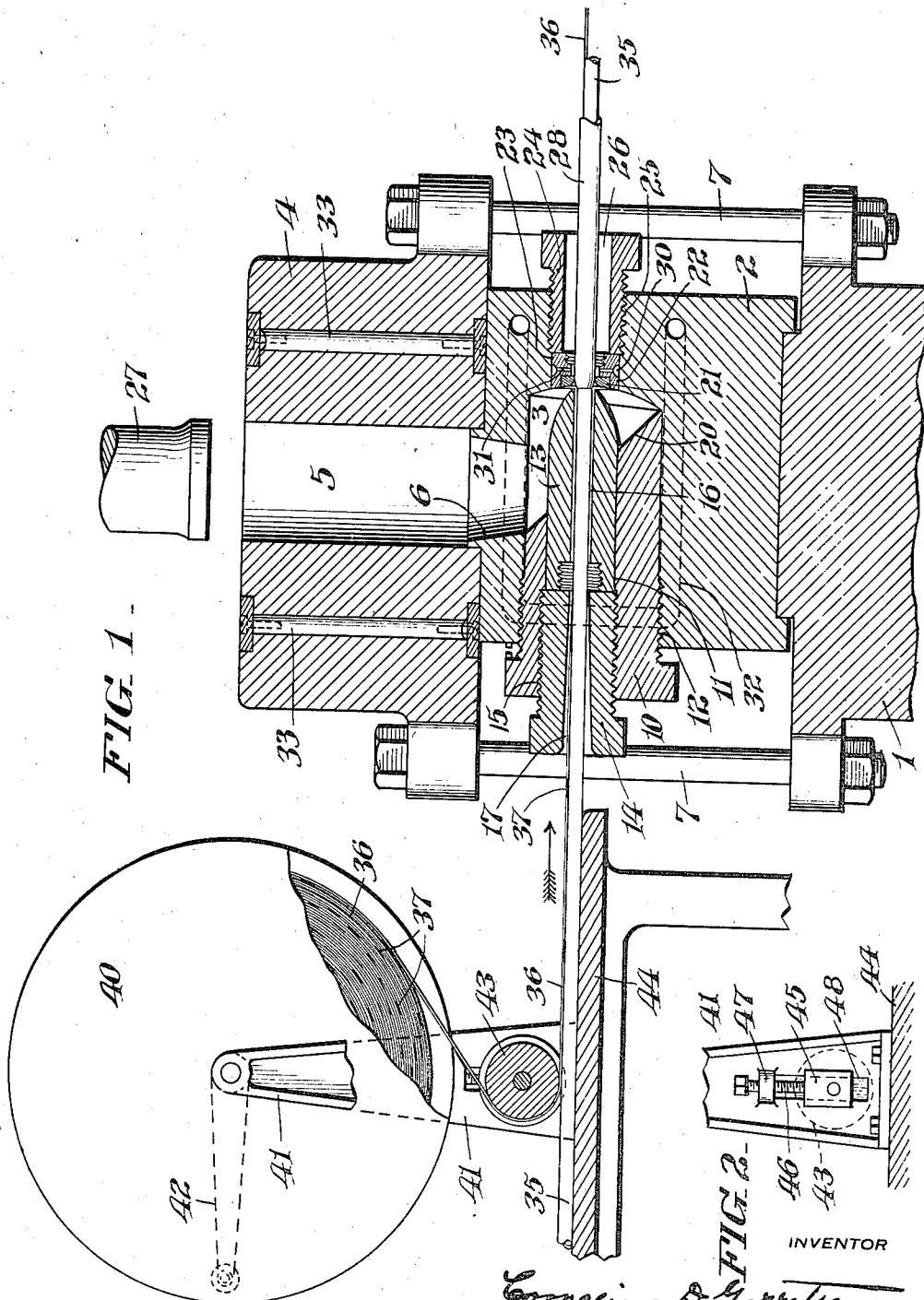


C. D. GARRETSON.
 APPARATUS FOR MARKING RUBBER HOSE.
 APPLICATION FILED AUG. 20, 1910.

995,783.

Patented June 20, 1911.

2 SHEETS-SHEET 1.



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2 SHEETS—SHEET 2.

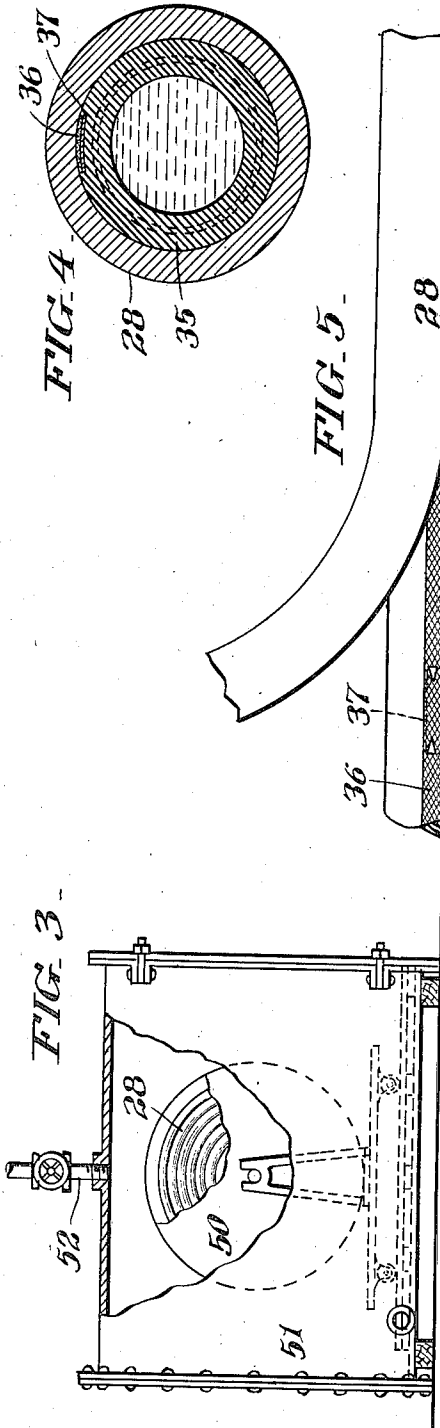


FIG. 4.

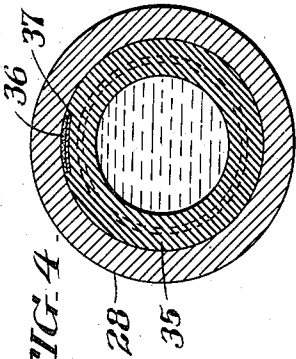


FIG. 5.

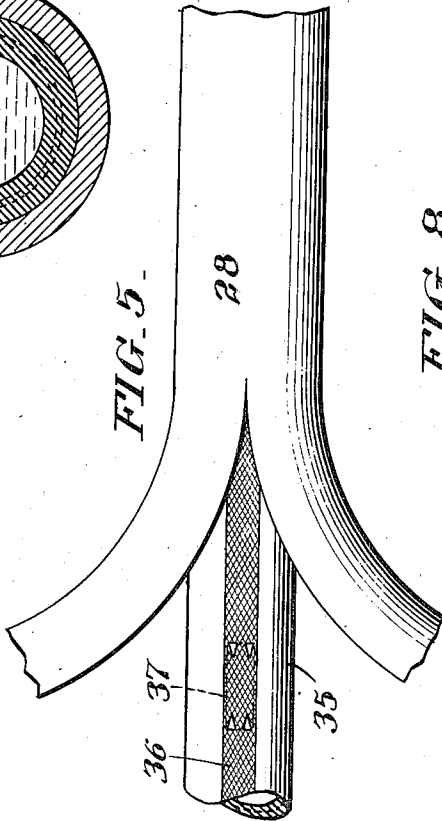


FIG. 6.



FIG. 8.



FIG. 7.

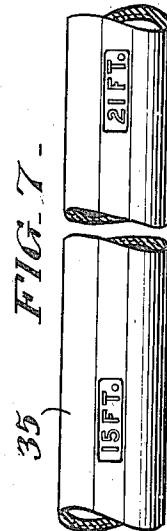
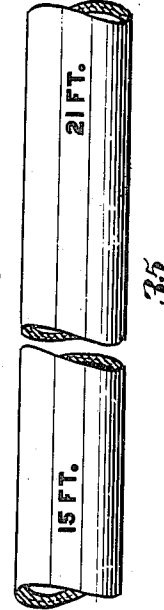


FIG. 9.



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UNITED STATES PATENT OFFICE.

CORNELIUS D. GARRETSON, OF WILMINGTON, DELAWARE, ASSIGNOR TO ELECTRIC HOSE AND RUBBER COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

APPARATUS FOR MARKING RUBBER HOSE.

995,783.

Specification of Letters Patent. Patented June 20, 1911.

Application filed August 20, 1910. Serial No. 578,144.

To all whom it may concern:

Be it known that I, CORNELIUS D. GARRETSON, a citizen of the United States, residing at Wilmington, in the county of New-castle, State of Delaware, have invented new and useful Improvements in Apparatus for Marking Rubber Hose, of which the following is a specification.

Heretofore, as far as I am aware, rubber hose has not been provided with markings thereon to indicate its length nor have machines been provided heretofore which were adapted to mark or cause the marking of hose to indicate its length during the process of its manufacture. The result has been that the hose is usually placed upon the market on reels and from time to time, as desired by purchasers, portions of the same have been measured off and sold. Mistakes in measurement occur causing the belief of the dealer making the mistake that the reel of hose did not contain the quantity of hose which it was stated by the manufacturer to have contained thus causing annoyance not only to the dealer but to the manufacturer.

My invention relates to apparatus employed in the manufacture and in the marking of rubber hose and it has for one of its objects to provide a machine or apparatus which will mark the hose during the process of its manufacture without adding materially to the cost of manufacture.

A further object of my invention is to provide an apparatus having mechanism which is adapted to supply continuously marking means to the hose while in a soft condition as the latter is supplied to a tube forming machine of known construction.

In order that my invention may be clearly understood, I shall show a portion only of the said tube forming machine and the mechanism which I have provided for the purpose of causing the hose to be marked during the process of its manufacture; and I have also illustrated a portion of rubber hose in its final or completed form.

In the drawings I have illustrated a convenient form of embodiment of my invention, but it is to be understood that the same may be embodied in other forms of construction and that my invention is not limited to the specific construction illustrated.

In the drawings,—Figure 1 is a longitudinal vertical section of a portion of the apparatus employed in the practice of my invention; Fig. 2 is a view showing a detail of construction of the apparatus shown in Fig. 1; Fig. 3 is a side elevation, with a portion broken away, of a vulcanizing chamber showing hose inclosed in its casing in position to be vulcanized; Fig. 4 is a transverse section of hose, a marking means in contact with the hose and a casing surrounding the hose and marking means,—water being indicated within the hose; Fig. 5 is a view of a portion of hose showing the casing in the act of being removed and also showing the marking means in contact with the hose; Fig. 6 is a plan view of a portion of tape having a marking die secured thereto; Fig. 7 is a view of a portion of finished hose showing the number thereon indicating the length of the hose; Fig. 8 is a view of a modified construction of means for marking the hose; and Fig. 9 is a view of a portion of hose showing the marking thereon by the means shown in Fig. 8 to indicate the length of the hose.

Before proceeding with a discussion in detail of the rubber hose forming and constituting my invention and the apparatus by the means of which the same is manufactured, I desire to call attention to the fact that the tube forming machine, which I have illustrated in Fig. 1 of the drawings, is substantially the same as the machine illustrated in United States Letters Patent to Henry B. Cobb, No. 558,257, dated April 14th 1896, particularly Fig. 2 of said patent,—although slight modifications in the details of constructions may be noted. For a full and complete description of the portion of the machine or apparatus illustrated in Fig. 1 which is employed for the formation of the lead tube, reference may be had to the drawings and the specification of said Letters Patent. The portion of the machine or apparatus illustrated in Fig. 1 of the drawings of my application, which is employed for supplying the marking means in contact with the hose as the latter is supplied to the tube forming machine, has been devised and added to said tube forming machine by me and separately and in combination with the said machine constitutes the

new machine or apparatus invented by me for the purpose of marking rubber hose during the process of its manufacture to indicate its length in feet or other denominations of measurement.

Referring now to the drawings, 1 designates the support for the block 2 having the die chamber 3 therein. Supported upon the block 2 is a block 4 having a molten metal (preferably lead) receiving chamber 5.

6 designates an opening or passage way from the molten lead receiving chamber 5 into the die chamber 3. The molten lead is poured from a melting furnace, not shown, into the top of the chamber 5.

The blocks 2 and 4 are secured together and to the base 1 by means of bolts 7.

10 designates a sleeve having an eccentrically located opening 11 therein,—the thicker side of the said sleeve being located at the lower side of the die chamber 3. The sleeve is secured in the die chamber by means of a screw-threaded connection at 12 therewith as is clearly shown.

13 designates the male member of a die which is located in the opening 11 in the sleeve 10. The die member 13 is held in position by means of a plug or block 14 having a screw-threaded connection with the interior of the sleeve 10 as indicated at 15. The die member 13 is provided with an axial opening 16 in alinement with the opening 17 in the block 14.

The inner end of the sleeve 10 is beveled or inclined at an angle of about 45 degrees as indicated at 20 and forms substantially a continuation, at a different angle of inclination, of one side or portion of the inclined wall of the opening or passageway 6. The inclined end 20 of the sleeve 10 forms a shoulder surrounding the die member 13. It will be observed that the inner reduced end portion of the die member 13 is surrounded by a portion of the die chamber 3 and that it projects centrally of and in proximity to the surrounding walls of the opening of the female die member 21 which is mounted in a sleeve 22 supported in an opening 23 in the block 2. The sleeve 22 and the die member 21 are secured and held in position by means of the plug 24 which has screw-threaded connection with the opening 25 in the block 2. The plug 24 is provided with an opening 26, the diameter of which is considerably greater than that of the female die member 21.

The molten lead is forced from the lead receiving chamber 5 by means of a hydraulic piston 27 (the means for operating said piston not being shown) and as it is forced between the adjacent portions of the die members 13 and 21 is formed into a tube 28 as is fully described in the Letters Patent to Cobb, mentioned above.

Owing to the provision of the inclined

wall 20, the discharge of lead from the lead chamber under the pressure of the hydraulic piston to which it is subjected meets with such comparatively little impediment or resistance that it forms and ejects the tubing with a speed so great as to preclude the cooling of the lead sufficiently to cause it to set as it is formed into the tube. To overcome this difficulty, means, such as is shown in the Letters Patent to Cobb, No. 558,257, is provided for cooling the female die to cause it to chill the lead as the tube is formed, and which may be described as follows: A groove 30 around annular sleeve 22 is provided to which is supplied, from a source not shown, cold water or other fluid cooling means which passes from the said groove through the passage ways 31 into contact not only with the female die member 21 but also into direct contact with the lead tube as it leaves the said die member. Also it will be understood that the contact of the cold water with the annular sleeve 22 causes a cooling of the said sleeve which cooling effect is, by conduction, transferred to the female die member 21. The formation of the tubing in the manner stated causes a progressive forward movement of the same.

For the purpose of maintaining the lead in the die chamber 3 in a molten condition, I have provided passage ways 32 through the block 2 to which is supplied steam or other heated fluid. I have also provided means for maintaining the lead in the chamber 5 in molten condition which consists of passage ways 33, two only of which are shown in the drawings, to which is supplied steam or other heated fluid. The arrangement of the passage ways 32 and 33 is not shown in detail because a description of the same is to be found in the Letters Patent to Cobb aforesaid.

In Fig. 1 of the drawings I have illustrated a portion of soft rubber hose 35 and a tape or other form of carrier 36 of a suitable material, preferably asbestos fabric, which extends through the openings 16 and 17, through the die member 21 and through the enlarged opening in the plug 24,—said hose and tape extending inside of the leaden tube 28. Although I prefer to use a carrier consisting of a tape of asbestos fabric such carrier may consist of cotton thread fabric or of any other material which it may be found practicable to use and need not necessarily be in the form of a flat tape but may consist of a metal wire or a metal band.

The tape in the construction shown in Figs. 1 to 7 is provided at intervals, preferably of one foot, with thin plates of metal or other suitable material 37 having depressed figures and letters formed therein in reverse as is indicated in Fig. 6. The plates 37 and their carrying tape are placed in con-

tact with the hose as it enters the tube forming machine illustrated in Fig. 1. The tape is mounted upon a drum or spool 40 revolvably mounted upon uprights or standards 41. Its supporting axle or pivot is provided with a crank 42 by means of which it may be revolved if desired. The tape, as is indicated, is wound upon the spool 40 and after leaving the same extends partially around and under a guide roller 43 which is located in position above the hose as it is directed to the pipe forming machine shown in Fig. 1.

The hose and the uprights and standards 41 are supported upon a platform or table 44. In order that hose of different sizes may be passed underneath the guide roller 43, the latter is adjustably supported in the manner indicated in Fig. 2 of the drawings in which, 45 designates a bearing in which the axle or pivot of the roller 43 is journaled. The bearings are supported upon bolts 46 which have screw threaded connection with lugs 47 formed upon the uprights or standards 41. The axle of the roller 43 is moved vertically in slots 48 in the uprights or standards 41 by turning the bolts 46.

It will be understood that the sizes of the openings 16 and 17 and also the openings through the female die member 21 may be increased or diminished for the purpose of operating upon and forming a solid metallic casing around hose of different sizes or cross sectional areas.

In the manufacture of the hose alternate layers of rubber and woven fabric are employed in the usual manner, after which the hose of whatever length it may be is filled with water under pressure sufficient to maintain the hose in circular shape in cross section. The opposite ends of the hose being closed, the hose is supported in a suitable manner and one end portion thereof is placed under the roller 43; and the said end portion together with the end portion of the tape carrying a marking means, which means is carried at intervals upon the said tape, is inserted into the die members 15 and 21, after which the hydraulic piston 27 is operated to force the molten lead from the chamber 5 through the die chamber 3 and outwardly around the die member 13 and through the female die member 21 to form the tube 28 around the hose and around the tape and the marking means which are in contact therewith. The formation of and the presence of the casing around the hose and the tape in contact therewith holds the tape in definite relation to the hose; and the pressure of the casing is sufficient also to cause progressive forward movement of the hose and tape with the said casing.

From the machine illustrated in Fig. 1 of the drawings, the hose and its casing are carried to and wound upon a drum, the

water pressure therein being in a known manner maintained, one of said drums being shown in Fig. 3. It is also to be noted here that preferably though not necessarily the weave of the fabric constituting the tape 36 should be the same as that of the fabric comprised in the hose structure, for the reason that it is desirable that in the vulcanization process when the leaden casing and the inclosed hose and tape are subjected to heat and pressure the tape and the fabric entering into the hose structure should expand and contract in the same ratio or degree.

As already stated, after passing from the machine illustrated in Fig. 1, the leaden casing together with the inclosed hose and tape are wound upon a drum. Afterward the pressure upon the water within the hose, the hose and the tape remaining within the casing, is increased as may be desired, say two hundred to three hundred pounds; the ends of the hose being thereafter securely closed so as to maintain such pressure.

In the process of vulcanization the hose and the tape within the leaden casing, preferably upon a drum 50 as indicated in Fig. 3, are placed within the vulcanizing chamber 51. Steam is supplied to the chamber through a pipe 52 at such temperature as may be necessary to cause a complete vulcanization of the hose. After the vulcanization is complete the steam is allowed to escape from the vulcanization chamber through a port or opening in a known manner located preferably at the bottom of the said chamber. My invention does not involve a change in the method of vulcanization and, therefore, I shall not enter into a further description of the same.

The conversion of the water in the hose into steam due to the high temperature of the steam admitted to the vulcanizing chamber 51 is prevented by reason of the fact that it is surrounded by the metal casing or tube 28 which resists the expansion of the water and maintains it in a liquid state. The tendency of the water to expand exerts great pressure upon the hose from within against the interior of the casing or tubing 28 and against the tape 36 and plates 37 and causes the tape and said plates to become embedded in the surface of the hose and also causes the material of the hose to project into the depressions formed in the metallic plates with the result that in the completed hose the letters and figures which are in reverse upon the marking plate or other means are reproduced in upright or positive position upon the hose as shown in Fig. 7.

If the letters upon the plate are formed by the depressions of the material thereof, the letters upon the hose will project above the surrounding surface of the hose. On the

other hand, if the letters and figures upon the marking plate or other means are raised, the letters and figures upon the hose will be depressed. After the vulcanization of the hose the lead casing is split by any suitable mechanism upon opposite sides and is removed in the manner indicated in Fig. 5; after which the tape 36 carrying the marking means 37 may be separated from the hose. After separation of the tape from the hose, the markings to indicate the number of feet or other denominations of length in the hose will be indicated in the manner shown in Fig. 7 in which the letters and figures 15 Ft. and 21 Ft. will consist of portions of the material of the hose extended above the surrounding surface. It should be stated that the surface surrounding the letters is depressed below the remaining portion of the surface of the hose a distance equal to the combined thickness of a plate 37 and the tape 36.

In Figs. 8 and 9 I have shown a modification of the marking means which consists in applying to the tape suitable marking means consisting of a substance which is transferable from the marking tape to the hose when the latter is subjected to heat and pressure during the course of its vulcanization. The figures and letters upon the tape in said Fig. 8 are indicated by the reference number 60 and are in reverse so that when they are transferred to the hose they will be upright or positive. The figures and numerals thus placed upon the hose to indicate its length are shown in Fig. 9 of the drawings. When the figures and letters are so placed upon the hose the surface of the hose is not interrupted thereby but is continuous and smooth, the coloring matter forming and constituting the said figures and letters being combined with and entering into the substance of the hose.

Having thus described my invention, I claim:—

1. In an apparatus of the character described, the combination of a tape, marking means thereon, guiding means for bringing the tape into contact with a hose, a pipe forming machine and means for feeding the tape and hose inside the said pipe.

2. In an apparatus of the character described, the combination of a tape, means for supporting the said tape, guiding means for the said tape, means for supporting a hose in proximity to the said guiding means whereby the said tape and hose may be placed in contact with each other, a lead

pipe forming machine and means for feeding the hose and tape inside the lead pipe. 60

3. In an apparatus of the character described, the combination of a tape having marking devices thereon, the said tape being in contact with a hose, holding and guiding means for the said hose and tape, lead pipe forming dies surrounding the hose and tape, a lead container in part surrounding the hose and tape and communicating with the dies, and a plunger for forcing the lead through the dies to surround the hose and tape and feed them forward. 70

4. In a device of the character described, the combination of a tape having marking devices thereon consisting of metal plates having letters formed therein, means for supporting and guiding a hose and the tape, lead pipe forming devices surrounding the hose and tape to form a lead casing around the said hose, tape and marking plates carried by the latter and means for causing progressive movement of the said lead casing together with the hose and tape therein. 80

5. In an apparatus of the character described, the combination of a tape having marking devices at intervals thereon, a guide for bringing a hose and the tape into contact, a container for supplying molten metal for surrounding the hose and tape with a metallic casing and means for causing the formation of such casing and simultaneously causing a forward movement of the said casing together with the hose and tape therein. 90

6. In an apparatus for marking rubber hose, the combination of a tape of fabric having the same structure as the fabric in the hose to be marked, marking means on the said tape, a container for supplying molten metal for surrounding the said hose and tape with a casing and means for causing the formation of the said casing. 100

7. In an apparatus of the character described, the combination of marking means, a carrier for the said marking means, guiding means for bringing a hose and the carrier into contact, a pipe forming machine and means for feeding the hose and carrier inside the said pipe as formed. 105

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 19th day of August, A. D. 1910. 110

CORNELIUS D. GARRETSON.

In the presence of—

CYRUS N. ANDERSON,
IRVIN SHUFF, Jr.