

April 23, 1957

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ON A CONTINUOUS CORE

2,789,314

Filed July 12, 1954

2 Sheets-Sheet 1

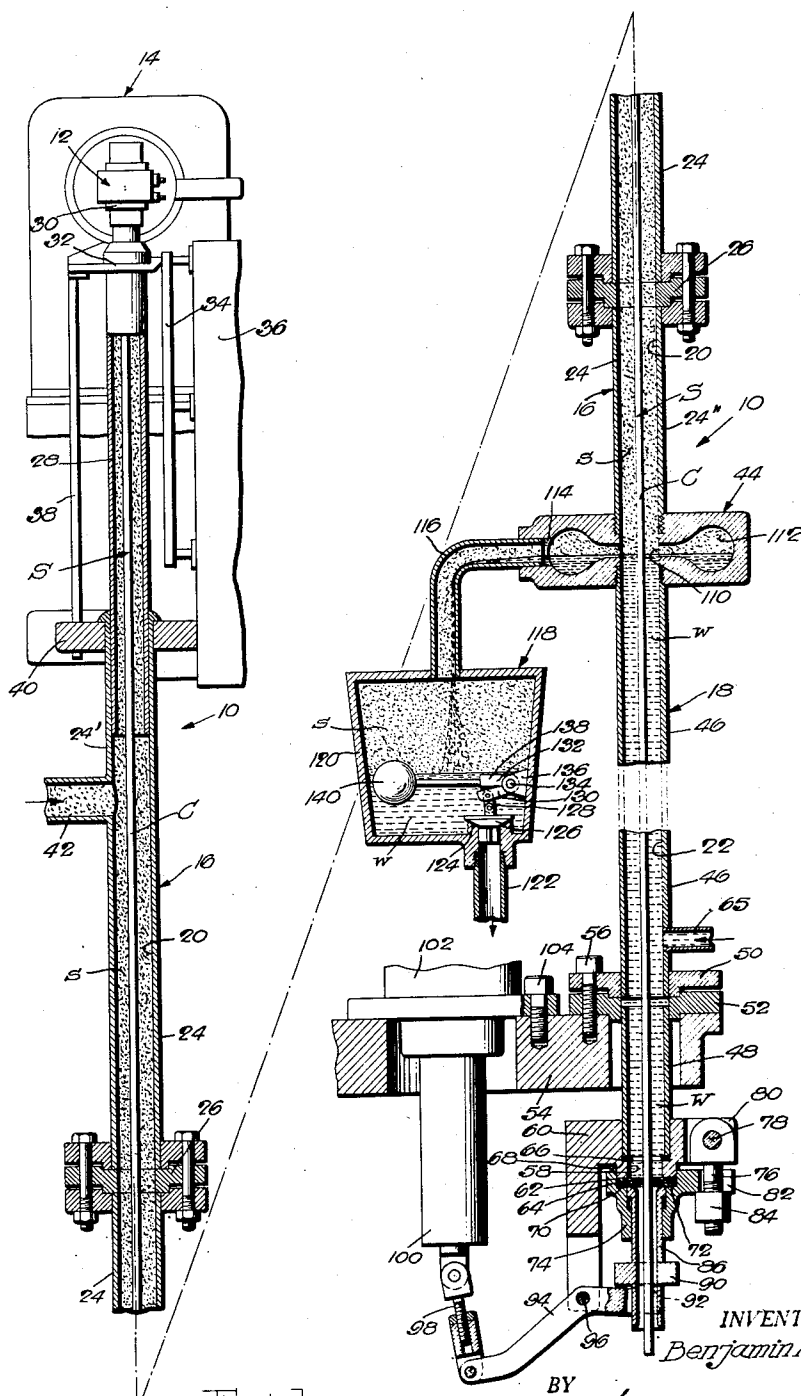


Fig. 1

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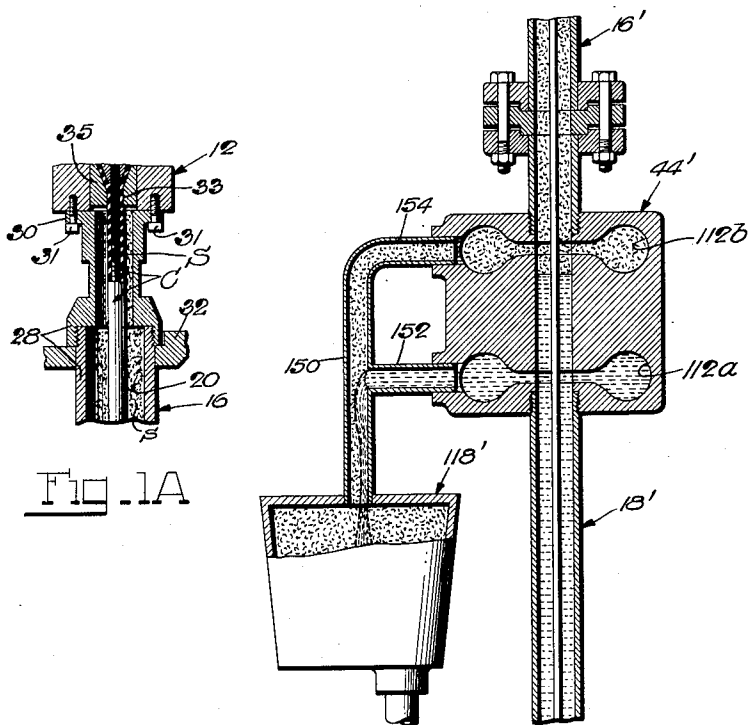


Fig. 1A

Fig. 2

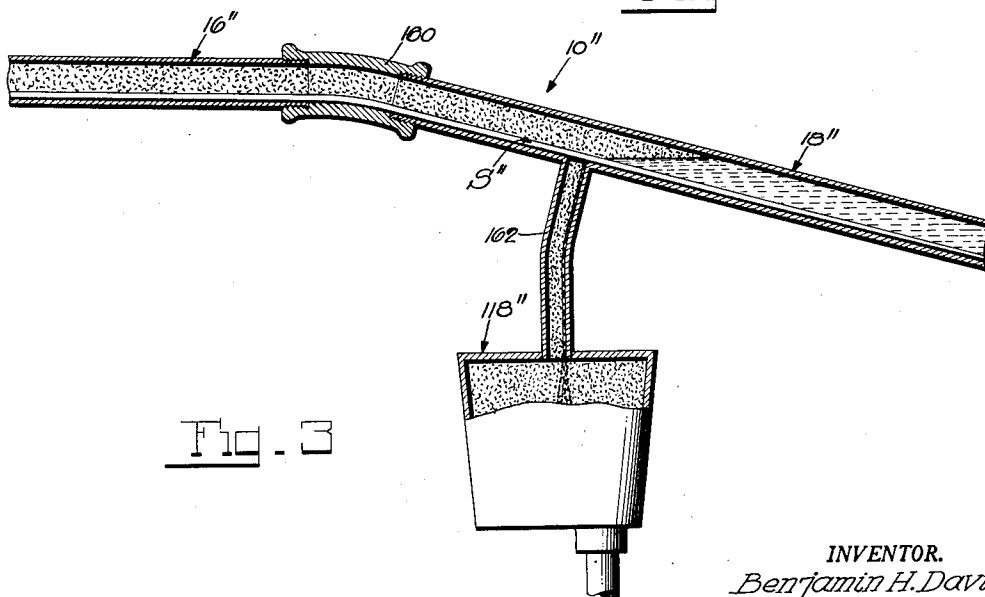


Fig. 3

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APPARATUS FOR VULCANIZING AN EXTRUDED SHEATH ON A CONTINUOUS CORE

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12 Claims. (Cl. 18—6)

This invention relates to the vulcanization of a rubber coating or sheath on a continuous core, and more particularly to apparatus for, vulcanizing an extruded sheath on a core immediately on passage of the latter from an extruder.

Apparatus of this type is used quite extensively, though not exclusively, in the electric cable industry for the vulcanization of an extruded rubber coating or sheath on a continuous cable immediately on its passage from the extruder. Prior apparatus of this type to which the present invention relates is of the kind used for the vulcanization of extruded rubber coating on a cable of which the conductive strand or strands are wrapped with jute and cotton or any other moisture-absorbing material. This prior apparatus comprises a steam chamber and a water chamber, both usually in the form of conduits which are arranged in tandem fashion. The steam conduit is connected with the extruder so that rubber-coated cable passes from the latter directly into the former wherein it is subjected to high-pressure steam which is continuously circulated therethrough. The length of the steam conduit is such that vulcanization of the rubber coating on the cable takes place while the latter passes therethrough at the same rate at which it passes through the extruder head, and the vulcanization of this rubber coating is completed when the cable passes into the water conduit through a seal which effectively separates the steam and water in the respective conduits. Water under pressure is continuously circulated through the water conduit in order to cool the vulcanized coated cable therein before it leaves the latter through another seal and emerges into the atmosphere where it usually passes over a capstan and onto a take-up reel.

The reason for cooling the vulcanized coated cable in the water conduit before permitting it to emerge into the atmosphere lies in the well-known capacity of the jute and cotton wrappings, for instance, on the cable's strands to absorb moisture which in the course of the coated cable's passage through the steam pipe is turned into entrapped steam of considerable pressure which would unduly stress, and even burst, the vulcanized cable coating, especially when of synthetic origin, if the cable would pass from the steam conduit directly into atmospheric pressure. Thus, the pressure of the circulating steam in the steam conduit is sufficiently high safely to contain the entrapped steam in the coated cable during the passage of the latter through the steam conduit, and the pressure of the circulating water in the water conduit is also sufficiently high safely to contain the entrapped steam in the coated cable until it is condensed therein and no longer exerts pressure on the coating of the cable by the time the latter passes from the water conduit into the atmosphere.

While this prior apparatus performs generally satisfactorily, it does have certain disadvantages. Thus, the imperative provision of at least two seals between the steam and water conduits and at the outlet end of the water conduit, and the customary provision of exhaust hoods

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in the vicinity of these seals, not only makes for complexity of the apparatus and accordingly high cost of the same, but also renders general maintenance, repair, or replacement of parts, of the apparatus rather complicated and costly. Further, the usual seal of rubber or rubber-like material between the steam and water conduits, subjected as it is to the high temperature in the steam conduit on the one hand, and to the much lower temperature of the cooling water on the other hand, deteriorates rather rapidly and, hence, requires frequent replacement in order to avoid excessive and wasteful leakage of steam into the water, especially since the customary pressure differential between the steam and cooling water is quite considerable with the steam pressure being usually much higher than the water pressure. Also, in order to achieve in the first place satisfactory separation between the steam and water in the respective conduits and between the atmosphere and the water under pressure in the water conduit by the aforementioned seals, the latter must necessarily impinge on the coated cable with considerable force, with the result that the vulcanized and as yet hot and dry coating on the cable is subjected to rather severe abrasion by the seal between the conduits, and may, in consequence, be marked so badly as to render the coated cable unfit as a marketable product.

It is an object of the present invention to provide apparatus of this type which not only has none of the aforementioned disadvantages of prior apparatus of this type, but also produces a vastly improved vulcanized sheathed cable or other product insofar as marking of the sheath thereof in the course of its vulcanization is concerned.

It is another object of the present invention to provide apparatus of this type of which the steam and water chambers or conduits continue uninterruptedly and lack a seal therebetween, and the circulating steam and cooling water therein meet at a designated level, so that the sheathed product passes directly from the steam into the water and is in the course of the entire vulcanization process impinged only once by a seal of rubber or rubber-like material which is located at the outlet end of the water conduit where the vulcanized rubber sheath of the product is wet and, hence, suffers no perceptible abrasion from the seal.

It is a further object of the present invention to provide apparatus of this type which, as aforementioned, lacks a seal between the continuous steam and water conduits, and the continuously admitted steam and water under pressure are confined in the respective conduits and meet at the aforementioned designated level, by arranging the conduits so that the cooling water is below the steam therein, and providing at the junction of these conduits, i. e. at the designated water level, a branch or outlet passage to a steam trap into which the circulating steam, all condensate thereof, and the circulating cooling water escape, and from which the water is periodically discharged for repeated use either in the production of further steam or for recirculation through the water conduit, or both, thereby greatly simplifying the overall construction of the apparatus and accordingly facilitating its maintenance and reducing its initial and maintenance cost, primarily by virtue of the absence of the heretofore most troublesome seal between the steam and water zones.

Another object of the present invention is to provide apparatus of this type in which despite the aforementioned absence of a seal between the steam and water zones and consequential direct contact between the steam and water, the latter mediums are readily kept in circulatory confinement substantially within the zones assigned to them, simply by delivering water usually at somewhat higher pressure than that of the steam so as to assure that the cooling water will not at all, or at the most only briefly,

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drop below its designated level, and selecting the aforementioned steam trap so that the same will periodically discharge its contents at a rate which is sufficiently high to prevent the water from climbing into the steam conduit or at the worst permit it to climb therein only for a brief period at a time and to an inconsiderable height therein.

A further object of the present invention is to provide apparatus of this type of which the aforementioned steam and water conduits may be arranged vertically and the steam conduit connected at its top with a vertical delivery-type extruder head, thereby to permit passage of a sheathed product through these conduits without frictional engagement with the same, except with the aforementioned seal at the outlet end of the water conduit, and hence, achieve most uniform vulcanization of the extruded sheath of the product throughout its circumference.

It is another object of the present invention to provide alternative apparatus of this type which has substantially the same advantages as the aforementioned vertical installation, but may be disposed horizontally where vertical space is limited and horizontal space is more readily made available, by disposing the steam conduit substantially horizontally and connecting it to a horizontal side delivery-type extruder head, and leading the water conduit from the steam conduit and outlet passage to the steam trap in sufficiently slanting fashion to achieve the aforementioned circulatory confinement of the steam and cooling water within the zones assigned to them.

Further objects and advantages will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a fragmentary longitudinal section, partly in elevation, of vulcanizing apparatus embodying the present invention;

Fig. 1A is an enlarged section through a part of the vulcanizing apparatus of Fig. 1;

Fig. 2 is a longitudinal section through a part of vulcanizing apparatus embodying the present invention in a modified manner; and

Fig. 3 is a longitudinal section through a part of vulcanizing apparatus embodying the present invention in a further modified manner.

Referring to the drawings, and more particularly to Fig. 1 thereof, the reference numeral 10 designates vulcanizing apparatus which in this instance is directly associated with the head 12 of an extruder 14 that is adapted to extrude a coating C of natural or synthetic rubber for example, on continuous stock S which may, for instance, be an electric cable having a conductive strand or strands wrapped with jute and cotton or any other moisture-absorbing material.

The vulcanizing apparatus 10 comprises successive conduits 16 and 18 which provide chambers 20 and 22 for the circulation therethrough of steam *s* and cooling water *w*, respectively. The conduit 16, being in any event of considerable length, is preferably made up of tube sections 24 which are suitably joined end-to-end as at 26. The conduit 16 is, in the present instance, disposed vertically, and its top-most tube section 24' receives a telescoping tube 28 which is axially slidable therein for releasable connection of its top flange 30 with the head 12 of the extruder 14 by means of bolts 31, for instance (Fig. 1A). A suitable packing or packings (not shown) are interposed between the top-most tube section 24' and sliding tube 28 to prevent leakage thereof of steam under pressure from the chamber 20. Suitable power means (not shown) are usually provided for sliding the tube 28 in either direction, and the latter is suitably guided for axial movement by having an attached crosshead 32 slidable in a guideway in a bracket 34 on a fixed support 36.

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The crosshead 32 may also carry a guide rod 38 which is slidable in a mounting bracket 40 for the top-most tube section 24'.

The extruder head 12 is of the vertical delivery-type and the aperture 33 in the extrusion die 35 therein (Fig. 1A) is in open communication with the interior of the steam chamber 20, so that the cable S with the extruded sheath or coating C thereon passes from the extrusion die directly into the steam chamber. One of the tube sections 24, preferably the top-most sections 24', has an inlet 42 for steam under pressure from any suitable source, such as a boiler, for instance.

The steam conduit 16 is, through intermediation of a separator 44 to be described, in end-to-end communication with the water conduit 18 which provides a main section 46 and a bottom section 48 attached to each other in sealed fashion by flanges 50 and 52 which are, in turn, attached to a fixed bracket 54 by bolt means 56. The water chamber 22 extends beyond the bottom section 48 of the water conduit 18 to an aperture 58 in another fixed bracket 60. The aperture 58 constitutes the outlet end of the water chamber and is there sealed by cooperating rings 62 and 64 of rubber or rubber-like material. The main section 46 of the water conduit 18 is provided, preferably in close proximity to its bottom section 48, with a water inlet 65 through which to introduce cooling water under pressure from any suitable source, as from a pump, for instance. The bottom section 48 of the water conduit 18 bears against a sealing washer 66 on an annular shoulder 68 in the bracket 60.

The sealing rings 62 and 64 are of a well-known conventional type and have central conical portions with equi-angularly spaced radial slits therein to divide the former into sector-like flaps. The sector-like flaps of one sealing ring customarily are angularly displaced from the like flaps of the other ring for better sealing performance. The sealing rings 62 and 64 and a centrally apertured spring disc 70 therebeneath are clamped at their outer peripheries between the bracket 60 and an annular shoulder 72 in a retainer member 74 which is releasably secured to the bracket 60 by a plurality of bolts 76 and cooperating nuts 84. Each bolt 76 may be pivoted at 78 in a slot 80 in the bracket 60 and swing into a slot 82 in the retainer member 74, while the associated nut 84 may be tightened on the bolt in order to secure the retainer member 74 to the bracket 60 and clamp the sealing rings 62, 64 and the steel ring 70 between the bracket 60 and retaining member 74.

The coated cable S passes through the sealing rings 62, 64 and the spring disc 70, and a tubular ram 86 is normally backed against the spring disc 70 to compel the latter substantially to flatten the aforementioned conical flaps of the sealing rings 62 and 64 and thereby force them into intimate sealing engagement with the extruded coating C on the cable S so as to prevent the escape thereof of water from the conduit 18. The ram 86 is axially slidable in the retainer member 74 and retractible from backing relation with the spring disc 70 to relieve the latter and the sealing rings 62, 64 of all stresses and permit the unimpeded passage therethrough of a leading length of a new cable to be coated and vulcanized in a subsequent operation. The ram 86 is in this instance operated by power to move into and remain in backing relation with the spring disc 70, and is to this end provided with a collar 90 against which bears the roller-shaped end 92 of a lever 94 which is pivotally mounted intermediate its ends, as at 96, on the bracket 60, and has its other end connected through a lengthwise adjustable link 98 with a plunger 100 in a cylinder 102, which may be bolted at 104 to the bracket 54. Fluid under pressure may, through a conventional valve, be admitted into one end of the cylinder 102 and the other end may be vented, in order to urge the plunger 100 into the position shown in Fig. 1 for moving the ram 86 into, and retain it in, backing relation with the

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spring disc 70. Conversely, fluid under pressure may be admitted into the opposite end of the cylinder and the other end vented in order to permit the ram 86 to retreat from backing relation with the spring disc 70.

The aforementioned separator 44 between the steam conduit 16 and the water conduit 18 may be in the form of a casing having a central passage 110 to connect the steam and water conduits 16 and 18, the sections 24" and 46 of which may be threadedly received in the separator, as shown. In open communication with the central passage 110 in the separator 44 is a collecting chamber 112, having a lateral outlet 114 which, through a conduit 116, communicates with a steam trap 118. The steam trap may be of any conventional type suitable for the purpose in mind. The steam trap 118 shown by way of example in Fig. 1 comprises a container 120 having an outlet 122. Provided in the container 120 in close proximity to the outlet 122 is a seat 124 for a valve 126 which through a link 128 is connected with an arm 130 of a lever 132 that is pivotally mounted at 134 on a lug 136 in the container 120. Another arm 138 of the lever 132 carries a float 140.

To start an operation, the leading length of a continuous cable to be rubber-coated and vulcanized, or a leader attached thereto, is passed through the extruder head 12 and succeeding steam and water conduits 16 and 18, respectively, and finally through the sealing rings 62, 64 and the spring washer 70, while the extruder is inoperative, the ram 86 is retracted from the spring washer 70 and neither steam nor cooling water are admitted into the respective conduits 16 and 18. The leader or the leading end of the cable may then be drawn out from the vulcanizing apparatus to permit passage of the cable over the usual capstan and onto a take-up reel to which it will be suitably anchored. The continuous cable S may be wound on a reel and withdrawn therefrom and fed into the head 12 of the extruder 14 by any suitable feeding mechanism (not shown). The extruder may next be started into operation, and steam and cooling water under proper pressures may then be admitted into the conduits 16 and 18 through the respective inlets 42 and 65. As soon as the rubber stock in the extruder reaches proper plasticity for its extrusion onto the cable S, the latter may be set into motion and the extrusion and vulcanizing operation will get under way and continue until the trailing end of the cable passes through the extruder head and vulcanizing apparatus.

While the extruder and vulcanizing apparatus are in operation, the cable S is advanced at a uniform rate of speed first through the extruder head 12 where the coating C is extruded thereon, then through the steam conduit 16 and finally through the water conduit from where it emerges through the sealing rings 62, 64 into the atmosphere. While passing through the steam conduit 16, the extruded rubber coating C on the cable S is subjected to the high temperature and pressure of the steam therein and becomes, in consequence, vulcanized by the time the cable passes into the water conduit 18. However, it is also during the subjection of the coated cable S to the high temperature of the steam in the conduit 16 that the moisture in the jute and cotton wrappings, for instance, on the conductive strand or strands of the cable flashes into steam of relatively high pressure which might well burst open the extruded coating on the cable, were it not for the fact that the pressure of the surrounding steam in the conduit 16 effectively counteracts the outward pressure of the entrapped steam in the cable on the extruded coating thereon.

The pressure of the cooling water in the conduit 18 is also such as effectively to counteract the outward pressure of the entrapped steam in the cable on the extruded coating thereon until this entrapped steam becomes condensed and exerts no longer any pressure on the coating. This takes place while the cable with its

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then vulcanized rubber coating passes through the water conduit 18, so that there is no longer any danger of bursting of the rubber coating when the cable finally emerges from the vulcanizing apparatus into the atmosphere through the sealing rings 62, 64.

While the vulcanizing apparatus is in operation, steam under pressure from any suitable source is continuously admitted through the inlet 42 into the steam chamber 20 wherein it will flow toward the separator 44 and thence through the conduit 116 into the steam trap 118. Water under pressure from any suitable source is also continuously admitted through the inlet 65 into the water chamber 22 wherein it will rise to the separator 44 and from there escape through the conduit 116 into the steam trap 118 for its periodic discharge therefrom.

Discharge of cooling liquid and all condensate in the exemplary vulcanizing apparatus described herein and shown in Fig. 1 is achieved by venting the conduit, at the junction of its designated steam and water chambers, into a steam trap, the same end may be achieved by providing the water conduit 18, near the normal or designated water level therein, with a reducing valve, for instance, through which to permit the escape of water and condensate at a controllable rate such that the water level will remain more or less constant.

In order constantly to circulate water through the water chamber 22 and out through the separator 44 and steam trap 118 so as assuredly to cool the vulcanized coating on the passing cable, the pressure of the water is, in accordance with the aforementioned method, preferably higher than that of the steam so that the water will constantly overflow into the chamber 112 in the separator and from there escape into the steam trap 118. However, the pressure of the water should not exceed the steam pressure to such an extent that the water level may rise appreciably into the steam chamber and entrap the steam therein for any length of time, and in consequence, jeopardize the proper vulcanization of the rubber coating on the cable. The respective pressures of the steam and water may readily be controlled and the steam trap selected for its capacity, so that the steam and water are kept substantially constantly within circulatory confinement in their respective designated zones, i. e. in the steam and water chambers 20 and 22, respectively. However, no harm will be done if the water level should rise slightly into the steam chamber 20 as long as the same drops beneath the latter on each periodic discharge of water and condensate from the steam trap 118.

The opening of the valve 126 in the steam trap 118 is under the control of the float 140. Thus, as the water level in the trap 118 and the float 140 rise to a predetermined height, the valve 126 will be opened for the discharge of water therefrom until the water level and float drop to a predetermined low level (Fig. 1), at which time the valve 126 is again closed. Hence, the discharge of water from the trap 118 is periodic and the frequency of the discharge depends solely on the rate at which cooling water and condensate accumulate in the trap.

By interposing the separator 44 and steam trap 118 between the steam and water chambers 20 and 22, respectively, the latter may be continuous with each other and devoid of any seal therebetween. The lack of any seal between these chambers is highly advantageous in comparison to prior vulcanizing apparatus employing a seal between the steam and cooling water therein. Thus, by omitting this seal, the overall construction of the present vulcanizing apparatus becomes greatly simplified and its maintenance accordingly facilitated, all of which is reflected in lower initial cost as well as in lower maintenance cost of the equipment. Further, by passing the cable with its vulcanized and as yet hot and dry rubber coating from the steam directly into the cooling water without encountering any abrasive action from a tight seal thereat, the coating will not at all become

marked on the passage of the cable from the steam chamber into the water chamber. This leaves only one seal through which the coated cable will have to pass on its travel through the vulcanizing apparatus, and this seal is at the outlet end of the water chamber. However, this latter seal will hardly mark the coated cable on its passage therethrough, for the rubber coating is then effectively cooled, and above all wet, so that it will pass with little friction through this seal which, being of rubber or a rubber-like material and wet where impinging on the coated cable, offers exceptionally little resistance to the passage of the latter while effectively sealing the outlet end of the chamber 22 against the escape of water therefrom. The absence of a seal between the steam and water chambers 20 and 22 and the ensuing unimpeded passage of a cable from the steam directly into the cooling water also facilitates the task of leading the end of a new cable to be coated and vulcanized through the vulcanizing apparatus prior to an operating run thereof. The absence of a seal between the steam and water chambers 20 and 22 and the passage of the coated cable during its entire travel through the vulcanizing apparatus through only one seal, and that one at the outlet end of the water chamber where the coated cable encounters very little friction from this seal as aforementioned, requires very little pull on the cable for its passage through the vulcanizing apparatus, with the result that the ensuing tensile stresses in the strand or strands of the cable and in the rubber coating on the latter will assuredly tear neither regardless of the cross-sectional overall dimension of the coated cable.

No effort is made here to define either the possible sizes of the vulcanizing apparatus or the pressures of the steam and cooling water therein, for these may vary widely, depending on the production capacity of the extruder, the kind of rubber, natural or synthetic, employed for the extrusion and the duration of its exposure to steam of a certain temperature and pressure for its complete vulcanization, the maximum permissible pull on the coated cable for its passage through the vulcanizing apparatus, the make-up of the cable including the capacity of constituents thereof to absorb moisture, the time required for entrapped steam in the cable to condense during the uninterrupted passage of the latter through the water chamber, and other factors. By way of example, the pressure of the steam in the steam chamber and the dimensions of the latter may for many purposes be the same as those of prior vulcanizing apparatus having a seal between the steam and water chambers, and the pressure of the cooling water has hereinbefore been alluded to as being preferably slightly higher than the steam pressure.

While the present installation has herein been described as a vulcanizing apparatus, it is, of course, fully capable for setting any extruded thermo-setting plastic on a cable, wherefore the term "vulcanizing" herein and in the appended claims is meant to include "setting" of extruded thermo-setting plastics. Also, while the description herein dealt with a coating by extrusion on an electric cable, it is fully within the purview of the present invention to coat a continuous core of any description and vulcanize the coating in the instant apparatus. Further, while the vulcanizing apparatus is especially advantageous for receiving in its steam chamber coated cable directly from the head of an extruder, the instant vulcanizing apparatus is by no means so limited and may receive extruded rubber or rubber-like stock with or without a foreign core, simply by introducing the stock into the steam chamber of the apparatus through a conventional seal or seals or packings.

Reference is now had to Fig. 2, which shows a modified separator arrangement between the steam and water conduits 16' and 18', respectively. Thus, the separator 44' has axially spaced collecting chambers 112a and 112b,

between which the water level may fluctuate. Both collecting chambers 112a and 112b are in communication with the steam trap 118' through a common conduit 150 having branches 152 and 154 which lead from the respective chambers 112a and 112b. With this modified separator arrangement, the control over the pressures of the steam and cooling water may be less accurate than is required in the previously described apparatus with its separator 44.

While the described vulcanizing apparatus in Fig. 1 is a vertical installation which, while extending to a considerable height that may well exceed more than two ordinary stories and requiring an extruder at the top thereof, is nevertheless advantageous from the standpoint of passing a coated cable therethrough without any frictional engagement therewith, except with the seal at the outlet end of the water chamber thereof, and with the extruded coating on the cable fully exposed to the steam on all sides of its periphery for most uniform vulcanization throughout, Fig. 3 shows a modified vulcanizing installation 10'' which may extend in a horizontal space where the latter may be made available more readily than the considerable vertical space required by the described vertical installation. To this end, the steam conduit 16'' extends substantially horizontally, and preferably slightly inclined from the extruder head downwardly toward the steam trap 118'' so that any condensate will flow toward and into the latter. The water conduit 18'' is considerably more inclined and is to this end connected with the steam conduit 16'' through an elbow fitting 160. The connecting conduit 162 between the steam trap 118'' and the water conduit 18'' is preferably spaced some distance from the connection of the latter with the elbow 160 so that the water level will normally be below the adjacent end of the water conduit and may rise therein some distance without entering and quickly spreading in the substantially horizontal steam conduit 16''. Accordingly, steam extends in the normal operation of the apparatus into the upper end of the water conduit 18''. While the coated cable S'' slides at least on the bottom of the steam conduit 16'' throughout a substantial part of the length of the latter, the heat and pressure of the surrounding steam nevertheless cause vulcanization of the coating on the cable substantially uniformly throughout and the coating is hardly marked by its sliding contact with the steam conduit 16''. To reduce friction between the coated cable S'' and the elbow 160 to a minimum, there may be provided in the latter a polished saddle (not shown) over which the cable may be guided.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

What is claimed is:

1. Vulcanizing apparatus for a continuous core with a vulcanizable sheath, comprising a longitudinal conduit closed at its opposite ends except for passages therein in which slidably to receive with a sealing fit a sheathed core for its passage through said conduit with clearance from the latter between its ends, successive lengths of said conduit constituting continuous steam and water chambers, respectively, of which said water chamber is below said steam chamber, and said conduit having an overflow passage intermediate its ends and inlets to said chambers, respectively, remote from said overflow passage; and a steam trap connected with said overflow passage, so that the latter defines the junction between said chambers and determines the normal water level in said water chamber.

2. Vulcanizing apparatus for a continuous core with a vulcanizable sheath as set forth in claim 1, in which said conduit is disposed substantially vertically.

3. Vulcanizing apparatus for a continuous core with a vulcanizable sheath as set forth in claim 1, in which said conduit is inclined to a horizontal plane.

4. Vulcanizing apparatus for a continuous core with a vulcanizable sheath as set forth in claim 1, in which said conduit is throughout the extent of said steam chamber disposed substantially horizontally with the remainder of said conduit inclined thereto.

5. Vulcanizing apparatus for a continuous core with a vulcanizable sheath, comprising a longitudinal conduit closed at its opposite ends except for passages therein in which slidably to receive with a sealing fit a sheathed core for its passage through said conduit with clearance from the latter between its ends, successive lengths of said conduit constituting continuous steam and water chambers, respectively, of which said water chamber is below said steam chamber, and said conduit having longitudinally spaced overflow passages intermediate its ends and inlets to said chambers, respectively, on opposite sides of said overflow passages and remote from the latter; and a steam trap connected with said overflow passages, so that the latter define the limits of a junction of longitudinal extent between said chambers within which the water level in said conduit will normally be.

6. Vulcanizing apparatus for a continuous core with a vulcanizable sheath as set forth in claim 5, in which said conduit is disposed substantially vertically.

7. Vulcanizing apparatus for a continuous core with a vulcanizable sheath, comprising longitudinally aligned upright conduits open at their adjacent ends and closed at their opposite ends except for passages therein in which slidably to receive with a sealing fit a sheathed core for its passage through said conduits with clearance from the same between said opposite ends thereof; a separator between said conduits, said separator having a through-passage providing communication between said adjacent conduit ends, and an overflow chamber larger in volume than said through-passage and communicating with said through-passage, the upper and lower conduits constituting steam and water chambers, respectively; inlets to said conduits, respectively, remote from said separator; and a steam trap connected with said overflow chamber.

8. Vulcanizing apparatus for a continuous core with a vulcanizable sheath as set forth in claim 7, in which said overflow chamber surrounds said through-passage and is in open communication with the latter peripherally throughout.

9. Apparatus for vulcanizing an extruded sheath on a continuous core immediately on its emergence from the extrusion die in the head of an extruder, comprising a longitudinal conduit having an open end for connection with said extruder head in alignment with the die therein, and being at its other end closed except for a passage therein in which slidably to receive with a sealing fit a sheathed core for its passage through said conduit with clearance from the latter except at said closed end thereof, successive lengths of said conduit constituting continuous steam and water chambers, respectively, of which said water chamber is below said steam chamber and the

latter extends to said open conduit end, and said conduit having an overflow passage intermediate its ends and inlets to said chambers, respectively, remote from said overflow passage; and a steam trap connected with said overflow passage, so that the latter defines the junction between said chambers and determines the normal water level in said water chamber.

10. Apparatus for vulcanizing an extruded sheath on a continuous core immediately on its emergence from the extrusion die in the head of an extruder, comprising a longitudinal conduit having an open end for connection with said extruder head in alignment with the die therein, and being at its other end closed except for a passage therein in which slidably to receive with a sealing fit a sheathed core for its passage through said conduit with clearance from the latter except at said closed end thereof, successive lengths of said conduit constituting continuous steam and water chambers, respectively, of which said water chamber is below said steam chamber and the latter extends to said open conduit end, and said conduit having longitudinally spaced overflow passages intermediate its ends and inlets to said chambers, respectively, on opposite sides of said overflow passages and remote from the latter; and a steam trap connected with said overflow passages, so that the latter define the limits of a junction of longitudinal extent between said chambers within which the water level in said conduit will normally be.

11. Apparatus for vulcanizing an extruded sheath on a continuous core immediately on its emergence from the extrusion die in a vertical delivery-type head of an extruder, comprising longitudinally aligned upright conduits open at their adjacent ends, of which the upper and lower conduits constitute steam and water chambers, respectively, the other end of said upper conduit being open and adapted for connection with said extruder head in alignment with the die therein and the other end of said lower conduit being closed except for a passage therein in which slidably to receive with a sealing fit a sheathed core for its passage through said conduits with clearance from the latter except at said other end of said lower conduit; a separator between said conduits, said separator having a through-passage providing communication between said adjacent conduit ends, and an overflow chamber larger in volume than said through-passage and communicating with said through-passage; inlets to said conduits, respectively, remote from said separator; and a steam trap connected with said overflow chamber.

12. Vulcanizing apparatus as set forth in claim 11, in which said overflow chamber surrounds said through-passage and is in open communication with the latter peripherally throughout.

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