

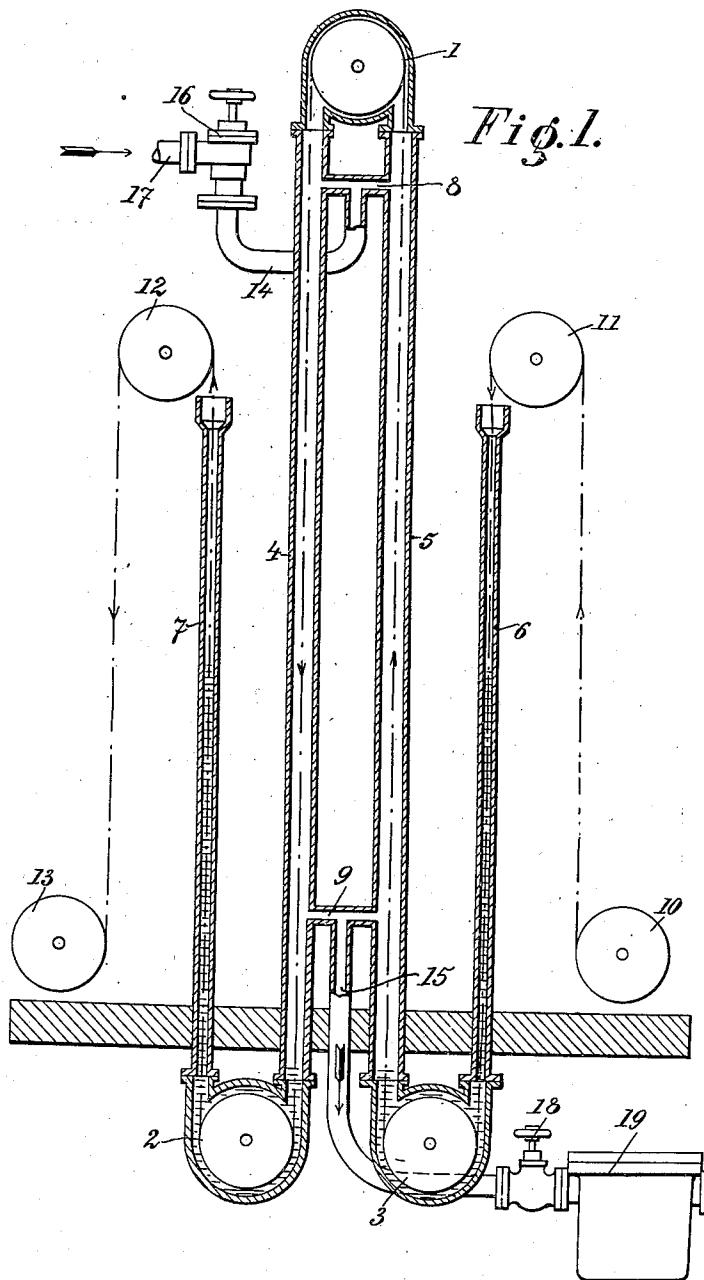
No. 891,687.

PATENTED JUNE 23, 1908.

W. D. GRATAMA.
VULCANIZER.

APPLICATION FILED JAN. 10, 1908.

2 SHEETS—SHEET 1.



Witnesses

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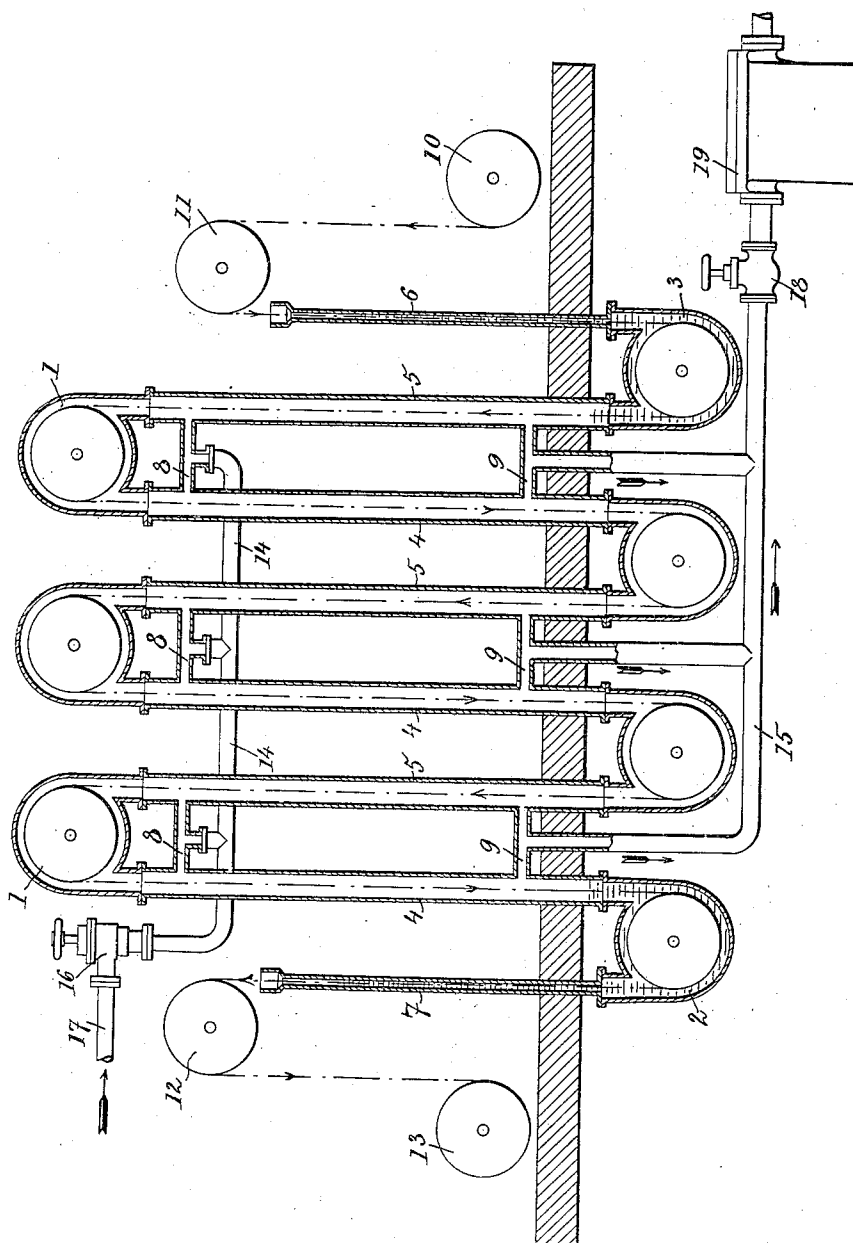
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Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLEM DIGNUS GRATAMA, OF RIJSWIJK, NETHERLANDS.

VULCANIZER.

No. 891,687.

Specification of Letters Patent.

Patented June 23, 1908.

Application filed January 10, 1908. Serial No. 410,171.

To all whom it may concern:

Be it known that I, WILLEM DIGNUS GRATAMA, a subject of the Queen of the Netherlands, residing at Rijswijk, in the Kingdom of the Netherlands, have invented a new and useful Vulcanizer, of which the following is a specification.

My invention relates to improvements in vulcanizers for vulcanizing endless or very long strips, belts, rods or the like of gutta-percha, india-rubber etc., also insulating layers on conducting wires or the like, whereby it is rendered possible to vulcanize these articles not by means of heat alone as hitherto, but also under pressure, so that a better quality of the goods is insured.

The improved vulcanizer may consist of two pulley or drum casings below, one pulley or drum casing above and two vertical tubes between them, to which steam or other fluid under pressure is admitted. For preserving the pressure of the steam or fluid, the two lower pulley or drum casings are filled with a shutting-off liquid, preferably mercury, through which the goods are passed. Preferably the two lower pulley or drum casings are connected with two vertical open tubes, in which the shutting-off liquid or mercury is permitted to rise under the pressure of the steam or fluid. Where so preferred, one or several pulley or drum casings may be inserted both below and above and connected with one another and with the preceding pulley or drum casings by means of vertical tubes, so that the goods may be passed through the whole vulcanizer in a serpentine line, only the two extreme lower pulley or drum casings and their open tubes being filled with the shutting-off liquid or mercury.

I will now proceed to describe my invention with reference to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section through an improved vulcanizer in a mode of execution, the pulleys or drums being indicated by circles, and Fig. 2 is a vertical longitudinal section through an improved vulcanizer, which comprises more pulley or drum casings than the preceding one.

The improved vulcanizer shown at Fig. 1 comprises an upper pulley or drum casing 1, two lower pulley or drum casings 2 and 3, two vertical internal tubes 4 and 5 hermetically connected with the upper and lower casings, and two vertical external tubes 6 and 7 open at the top. The two internal tubes 4

and 5 are connected with one another at top and bottom by means of suitable connections 8 and 9, of which the upper one 8 is connected by a tube 14, a stop valve 16, and a tube 17 with the source of steam or other fluid under pressure and the lower connection 9 is connected with a waste tube 15, a stop valve 18 and a steam trap 19 or the like. The pulley or drum casings 1, 2 and 3 may be of any known construction. The cross section of the several vertical tubes 4, 5, 6 and 7 may be circular, oval, rectangular or of any other shape in accordance with the goods to be treated. The whole vulcanizer is made tight with the exception of the upper ends of the two external tubes 6 and 7, which are left open. The vulcanizer and the external pulleys or drums 10, 11, 12 and 13 may be supported by any known frame, not shown. Normally the two lower pulley or drum casings 2 and 3 and the lower ends of all the vertical tubes 4, 5, 6 and 7 are filled with a shutting-off liquid, preferably mercury, up to a point beneath the lower connection 9.

The free end of the endless or very long strip, belt, rod or the like of gutta-percha, india-rubber, etc. to be vulcanized, is in any known manner passed over a pulley or drum 10 or unwound from a drum 10 and passed over a guiding pulley or drum 11 and introduced into the vulcanizer in the direction of the arrows. When it emerges from the shutting-off liquid or mercury within the first internal tube 5, the steam or fluid under pressure is turned on, so that it passes through the tube 17, the stop valve 16, the tube 14 and the connection 8 into the tubes 4 and 5 and the upper pulley casing 1 and acts upon the goods, while it forces the shutting-off liquid or mercury down in the internal tubes 4 and 5 and up in the external tubes 6 and 7, the head of the liquid being such, that the weight of its column per unit of area is equal to the pressure of the steam or fluid. The shutting-off liquid or mercury prevents the steam or fluid from escaping, and only the condensing-water is permitted to escape through the connection 9, the tube 15, and the stop valve 18 into the steam trap 19 or the like, which latter serves for preserving the pressure of the steam or fluid.

The vulcanized article leaving the vulcanizer and passing over a guiding pulley or drum 12, may be wound on the pulley or drum 13 or it may be conducted to some place for further treatment.

The length of the tubes 4, 5, 6 and 7 will have to depend upon the pressure of the steam or fluid and the specific weight of the shutting-off liquid. The two external tubes 6 and 7 must be made so long, that under the maximum pressure of the steam or fluid the shutting-off liquid can never overflow. The speed, with which the article is passed, depends of course upon the time, which the article of gutta-percha, india-rubber etc. or the insulating layer on a conducting wire, or the like requires for its vulcanization.

The vulcanizer described is also suitable for vulcanizing india-rubber belts with or without insertions and of any width, for vulcanizing solid rods of gutta-percha, india-rubber or the like intended for wheel rims, more particularly those of the cheaper sorts, such as for wheels of perambulators etc.

Where the space is limited, the length of the internal tubes 4 and 5 may be reduced and their number may be increased, additional pulley or drum casings similar to 1, 2 and 3 being inserted above and below and connected with the tubes, so that the goods to be vulcanized pass through the vulcanizer in a serpentine line. An example is illustrated in Fig. 2, which requires no further explanations. Of course only the extreme lower pulley or drum casings and their vertical open tubes need be filled with the shutting-off liquid or mercury.

I claim:

1. A vulcanizer comprising a chamber with two mouths sealed with a shutting-off liquid, means for passing the goods to be vulcanized through the shutting-off liquid in one mouth into the chamber and therefrom through the shutting-off liquid in the other mouth, and means for supplying a hot fluid under pressure to the chamber.

2. A vulcanizer comprising a chamber with two mouths sealed with mercury, means for passing the goods to be vulcanized through the mercury in one mouth into the chamber and therefrom through the mercury in the other mouth, means for supplying steam under pressure to the chamber, and means for leading off the condensing-water while preserving the pressure in the chamber.

3. A vulcanizer comprising a chamber with two mouths, two casings adjoining said two mouths and provided with two open erect tubes and filled with a shutting-off liquid, means for passing the goods to be vulcanized through the shutting-off liquid in one tube and casing into the chamber and therefrom through the shutting-off liquid in the other casing and tube, and means for supplying a hot fluid under pressure to the chamber.

4. A vulcanizer comprising a chamber with two mouths, two casings adjoining said two mouths and provided with two open erect tubes filled with mercury, means for

passing the goods to be vulcanized through the mercury in one tube and casing into the chamber and therefrom through the mercury in the other casing and tube, means for supplying steam under pressure to the chamber, and means for leading off the condensing-water while preserving the pressure in the chamber.

5. In a vulcanizer, the combination with an upper casing having two mouths, of two lower casings each having two mouths, two vertical internal tubes hermetically connecting the mouths of the upper casing with the internal mouths of the two lower casings so as to form a serpentine course, two vertical external tubes on the external mouths of the two lower casings and open at the top, guiding means in said three casings, means for supplying a fluid under pressure to said two vertical internal tubes, a shutting-off liquid in said two lower casings permitted to rise in said two vertical external tubes under the pressure of the fluid, and means for passing the goods to be vulcanized through the shutting-off liquid in one external tube and one lower casing through the serpentine course over said guiding means and through the shutting-off liquid in the other lower casing and other external tube.

6. In a vulcanizer, the combination with a plurality of upper casings each having two mouths, of a plurality of lower casings each having two mouths, a plurality of vertical internal tubes hermetically connecting the mouths of said upper and lower casings so as to form a serpentine course, two vertical external tubes on the remaining mouths of the two extreme lower casings and open at the top, guiding means in said upper and lower casings, means for supplying a fluid under pressure to said vertical internal tubes, a shutting-off liquid in the two extreme lower casings permitted to rise in said two vertical external tubes under the pressure of the fluid, and means for passing the goods to be vulcanized through the shutting-off liquid in one external tube and one external lower casing through the serpentine course over said guiding means and through the shutting-off liquid in the other extreme lower casing and other external tube.

7. In a vulcanizer, the combination with an upper casing having two mouths, of two lower casings each having two mouths, two vertical internal tubes hermetically connecting the mouths of the upper casing with the internal mouths of the two lower casings so as to form a serpentine course, two vertical external tubes on the external mouths of the two lower casings and open at the top, guiding means in said three casings, means for supplying steam under pressure to said two vertical internal tubes, mercury in said two lower casings permitted to rise in said two vertical external tubes under the

pressure of the steam, means for leading off
condensing-water from said two vertical
internal tubes while preserving the pressure
of the steam, and means for passing the goods
5 to be vulcanized through the mercury in one
external tube and one lower casing through
the serpentine course over said guiding
means and through the mercury in the other
lower casing and other external tube.
10 8. In a vulcanizer, the combination with a
plurality of upper casings, each having two
mouths, of a plurality of lower casings each
having two mouths, a plurality of vertical
internal tubes hermetically connecting the
15 mouths of said upper and lower casings so as
to form a serpentine course, two vertical
external tubes on the remaining mouths of
the two extreme lower casings and open at
the top, guiding means in said upper and

lower casings, means for supplying steam 20
under pressure to said vertical internal tubes,
mercury in the two extreme lower casings
permitted to rise in said two vertical internal
tubes under the pressure of the steam, means
for leading off condensing-water from said 25
internal tubes while preserving the pressure
of the steam, and means for passing the goods
to be vulcanized through the mercury in one
external tube and one external lower casing
through the serpentine course over said 30
guiding means and through the mercury in
the other extreme lower casing and other
external tube.

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Witnesses:

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