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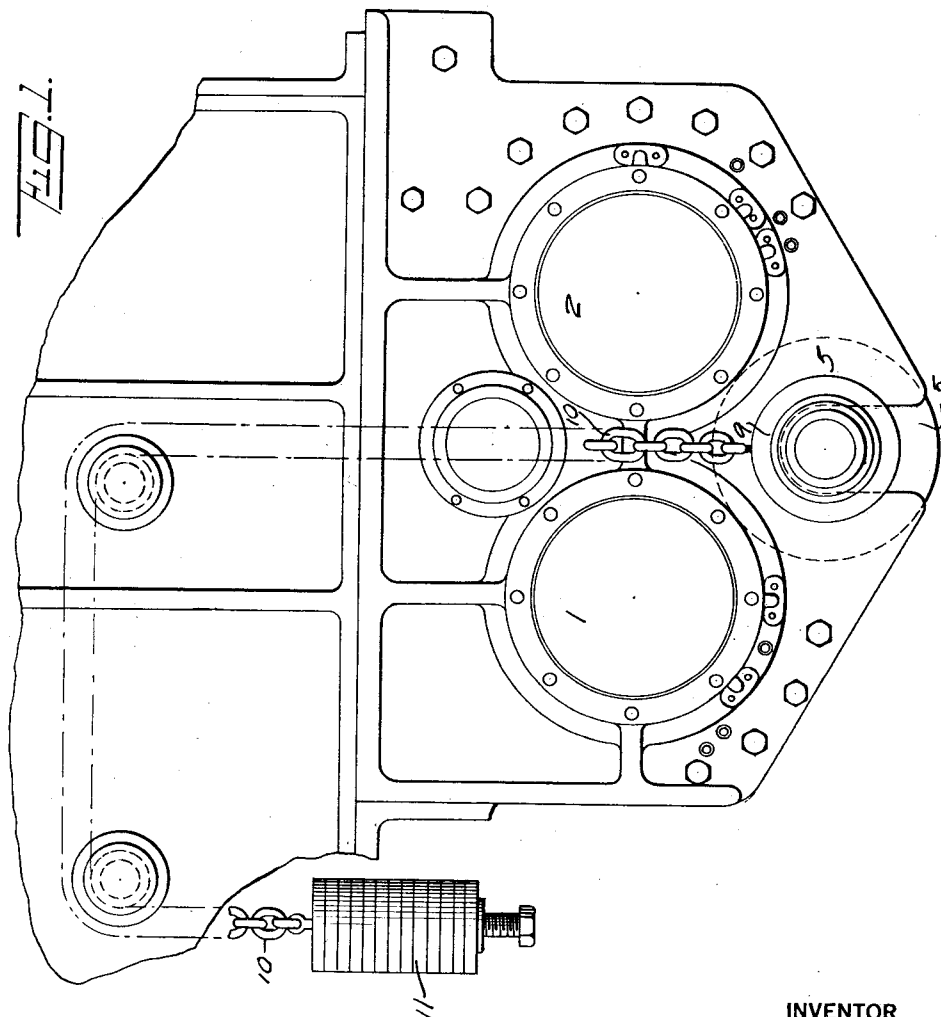
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VACUUM SEAL AND APPARATUS

Filed Dec. 10, 1926

2 Sheets-Sheet 1



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Fig. 2.

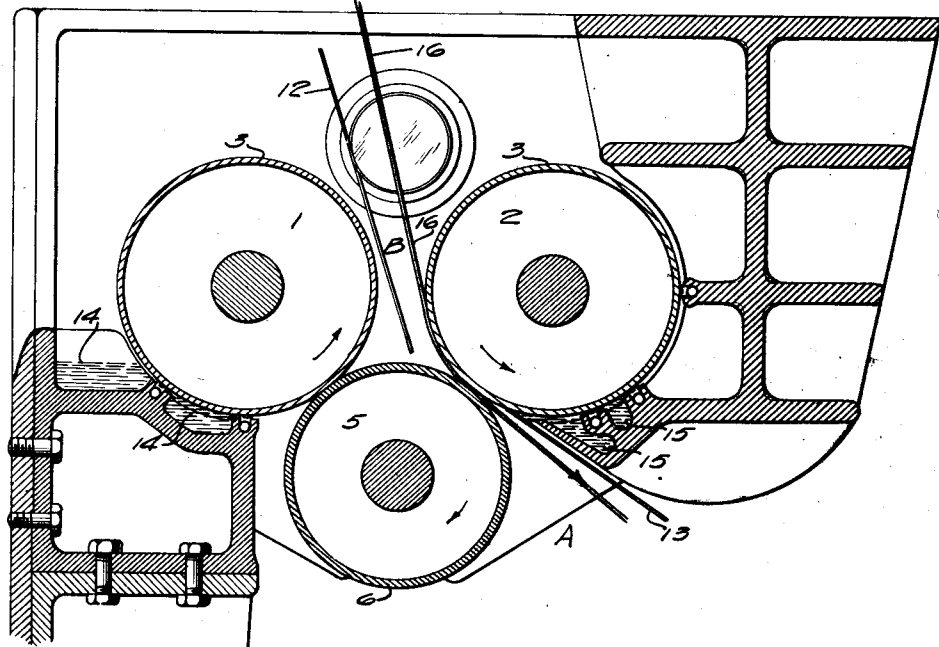
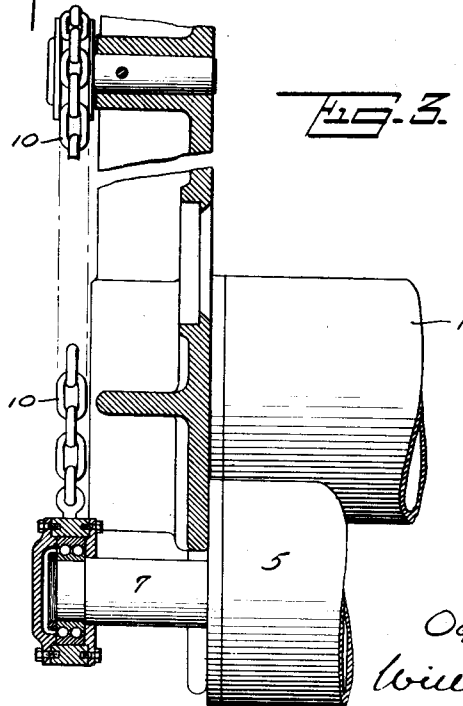


Fig. 3.



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VACUUM SEAL AND APPARATUS.

Application filed December 10, 1926. Serial No. 153,851.

My invention relates to sealing the entrance and exit passages of a vacuum chamber and is an improvement upon the seal shown in Letters Patent No. 1,595,240 granted to me August 10, 1926.

In that patent the seal disclosed consists of three rotating members, two of which are mounted in the same plane, the others resting by gravity upon, and making air-tight contact with, the surfaces of the other two; the surfaces of the two rolls mounted in the same plane and the end surfaces of all the rolls are in sliding engagement with the walls of the chamber and in contact with a liquid. By virtue of this apparatus and method the entrance and exit passages of the vacuum chamber are effectually sealed against the admission of air into the chamber.

My present invention consists of a seal for the entrance and exit passages of a vacuum drying apparatus, comprising three rotatable members mounted in the said passages in sliding engagement with the walls of said chamber and in air-tight contact relatively to each other, two of said members mounted to rotate in the same plane, the other of said members mounted below and forced by the vacuum in said apparatus and a weight into contact with the surfaces of the other two members and a liquid in contact with the surfaces of the members whose axes are in the same plane.

In the accompanying drawings the same reference numerals refer to similar parts in the several figures.

Fig. 1 is an elevation of the vacuum seal;

Fig. 2 is a vertical section of my vacuum seal, protecting the entrance passage and exit passage of the vacuum chamber;

Fig. 3 is a section showing the means for mounting the lower rotating member.

In the preferred form of my apparatus I employ three rolls to guard and seal each passage into and out of the vacuum chamber. As each seal is alike, I will describe only the seal guarding the exit passage. The rolls 1 and 2 are preferably composed of iron and provided with a brass periphery 3 and with steel bearing shafts 4. These rolls 1 and 2 are mounted to rotate in the same plane. Below these rolls I mount another roll 5 which is provided with a periphery of yielding material 6, such as rubber, and with a steel bearing shaft 7. I show the shaft 7 of roll 5 supported in the roller bearing 8 carried

in the frame 9, suspended by the chain 10 to the other end of which is attached the weight 11. The roll 5 is pressed against and makes air-tight contact with the surfaces of the rolls 1 and 2, by the force of the said weight and the atmospheric pressure upon said roll due to creating and maintaining a vacuum above the said roll. I provide the guards 12 and 13 to guide the sheet material in its passage. The liquid seals 14 and 15 and their attendant wipers are in all respects similar to those shown in my said patent, and need not here be again described.

In the operation of my invention a wet web of paper 16, or any other sheet material to be treated within the vacuum chamber, is fed into the entrance B of the vacuum chamber A by being brought into direct contact with the brass roll 2 and the rubber roll 5. The rubber roll 5 presses the web 16 firmly against the brass roll 2 and forms an air-tight rolling seal. The web of paper passes upward to the first of the usual drying cylinders (not shown) around and in contact with its surface, then downward to the next cylinder in the series and so on to the last cylinder of the series, which is mounted above the outgoing seal. Thus the web of paper leaving the last of the series of drying cylinders, drops of its own weight and being guided by the guards 12 and 13 it falls between the surfaces of the rolls 2 and 5. This feature is of very great advantage in actual commercial use of my vacuum dryer. The pass of the paper from the last dryer does not fail and the paper is automatically passed out, and in the best location for subsequent treatment in the sweat dryer before passing it to the calender rolls.

Vacuum driers built in accordance with my said patent are very large. The sealing rolls in some instances being two hundred and seventy inches wide, three feet in diameter and weighing about thirty thousand pounds. Some difficulty has been encountered in providing ball bearings of sufficient strength to carry the load of such heavy rolls. The seal herein described lends itself to reducing the load upon the roll and the paper is much more readily and efficiently handled.

Having thus described this invention in connection with one illustrative embodiment thereof, to the details of which I do not desire to be limited, what is claimed as new and what I desire to secure by Letters Patent is set forth in the appended claims.

What I claim is:

1. In a seal for the passages of a vacuum chamber, three rotatable members mounted in the passages in sliding engagement with the walls of said chamber and in air-tight engagement relatively to each other, two of said members mounted to rotate in the same plane, the other of said members mounted below and pressed against the surfaces of the other two members, and a liquid in contact with the surfaces of said members whose axes are in the same plane.

2. In a seal for the passages of a vacuum chamber, three rotatable members mounted in the passages in sliding engagement with the walls of said chamber and in air-tight engagement relatively to each other, two of said members mounted to rotate in the same plane, the other of said members mounted below and pressed against the surfaces of the other two members, said lower rotatable member being provided with a yielding surface and a liquid in contact with the surfaces of said members whose axes are in the same plane.

3. In a seal for the passages of a vacuum chamber, three rotatable members mounted in

the passages in sliding engagement with the walls of said chamber and in air-tight engagement relatively to each other, two of said members mounted to rotate in the same plane, the other of said members mounted below and pressed against the surfaces of the other two members, by the force of the atmosphere and a weight attached to said rotatable member, and a liquid in contact with the surfaces of said members whose axes are in the same plane.

4. In a seal for the passages of a vacuum chamber, three rotatable members mounted in the passages in sliding engagement with the walls of said chamber and in air-tight engagement relatively to each other, two of said members mounted to rotate in the same plane, the other of said members mounted below the other two members, a roller bearing for the shaft of said lower rotatable member, a casing for said roller bearing, a flexible member attached to said casing, a weight attached to the other end of said flexible member and means for suspending said flexible member and weight.

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