

March 9, 1926.

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1,576,163

VACUUM SEAL FOR VACUUM CLOTH HYDROEXTRACTORS

Filed Dec. 5, 1924

2 Sheets-Sheet 1

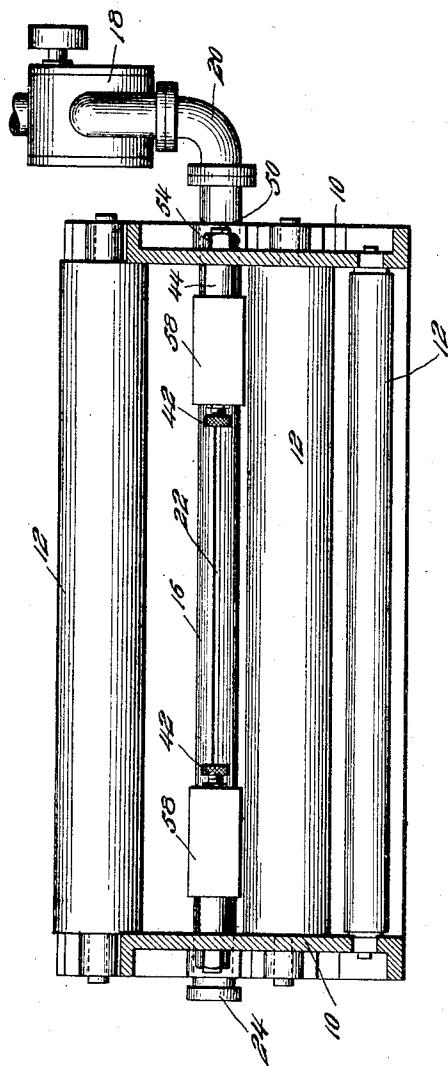


Fig. 1.

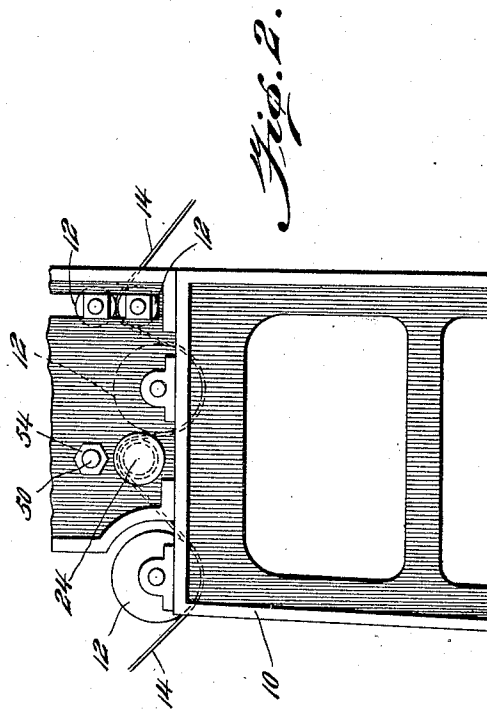


Fig. 2.

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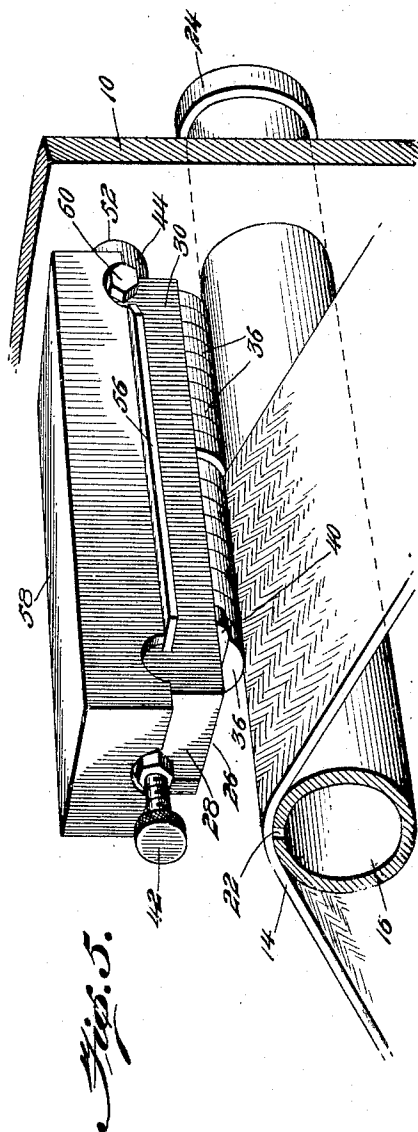
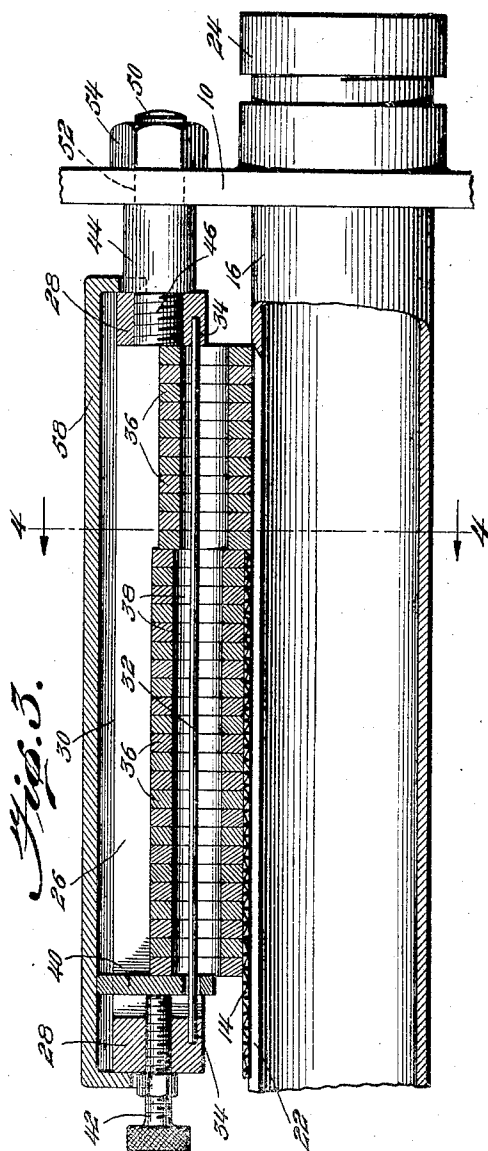
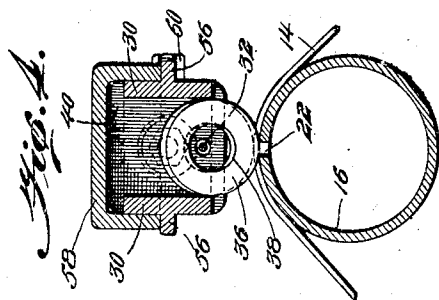
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

GEORGE W. VOELKER, OF WOONSOCKET, RHODE ISLAND.

VACUUM SEAL FOR VACUUM CLOTH HYDROEXTRACTORS.

Application filed December 5, 1924. Serial No. 754,167.

To all whom it may concern:

Be it known that I, GEORGE W. VOELKER, a citizen of the United States, residing at 65 Union St., Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Vacuum Seals for Vacuum Cloth Hydroextractors, of which the following is a specification.

My invention relates to the type of vacuum cloth hydroextractors in which the cloth held open to full width passes over a slotted pipe which acts as a combination vacuum chamber and support. My invention is a specific improvement on the construction shown in my former Patent #1,471,671, issued October 23, 1923.

In this type of machine the cloth passes over a longitudinal slot which extends substantially the length of the top surface of the pipe. The cloth normally does not pass over the entire slot and the main object of my invention is to effectually and automatically seal the end of the slot over which the cloth does not pass.

A further object of my invention is at all times automatically to seal the vacuum at the ends of the slot in the slotted member exterior of the cloth without preventing lateral motion of the cloth.

Specifically, my invention comprises series of metallic discs mounted on wires which extends longitudinally of two bottomless casings, said casings being mounted on the frame over each end of the slot in the slotted member. The rubber strips in my prior invention depended for their functioning on the atmospheric pressure alone. As in my new invention I employ hollow metallic discs, in addition to the atmospheric pressure, the weight of the discs assists in their functioning. A further object of my invention, therefore, is to specifically provide, combined gravity and atmospheric pressure actuated means for automatically sealing the vacuum at the ends of the slot of the slotted member.

Though the construction shown in my prior patent functions in a satisfactory manner, it has several objections. The flexible rubber pad covered so much of the surface of the cloth adjacent to the selvages, that the liquid was not sufficiently extracted adjacent to the selvages. As, due to the inherent construction of the disc members, they only contact the cloth at substantially

one point on their periphery directly above the slot, they provide greater hydroextraction efficiency.

A further object of my invention is to provide more durable means for this purpose than provided in my prior patent, the metallic discs lasting much longer than the rubber pad.

These and such other objects of my invention as may hereinafter appear will be best understood from a description of one embodiment thereof such as is shown in the accompanying drawings.

In the drawings, Fig. 1 is a plan view of a vacuum cloth hydroextractor partially shown in section showing the slotted pipe with my improved vacuum seal.

Fig. 2 is a fragmentary end view of the machine showing the cloth passing through.

Fig. 3 is a longitudinal sectional view partially shown in elevation of a vacuum seal in functioning position over the slotted pipe.

Fig. 4 is a sectional view taken along the line 4-4 of Fig. 3.

Fig. 5 is a detail perspective view of a vacuum seal and a portion of the slotted pipe with the cloth passing thereover.

In the drawings, wherein like characters of reference indicate like parts throughout, 10 indicates the frame of a vacuum cloth hydroextractor, on which are mounted the feed rollers 12 for drawing the cloth 14 spread out endwise over the slotted pipe 16. The slotted pipe 16 is hollow and is the suction applying member of the hydroextractor. It is mounted between the ends of the frame 10 of the hydroextractor and may be attached at one end thereof to the suction pump 18 by means of the pipe 20. The hollow pipe 16 has on its upper surface over which the cloth is drawn, the slot 22 which extends substantially its entire length. The end of the hollow pipe 16 opposite from the end attached to the suction pump 18 is provided with a suitable cap 24.

As stated, the cloth is drawn by means of the feed rollers 12 spread out in open form over the slot 22 in the hollow member 16. To insure that all the liquid is extracted from the cloth, the slot 22 does not extend quite the length of the hollow pipe 16 between the ends of the frame 10, but does extend for a slightly further distance than the width of the cloth, or the other material to be dried. My invention specifically comprises means to seal the ends of the slot

22 exterior of the selvages of the cloth 14 to prevent vacuum leakage and loss of suction pump efficiency, without preventing the unavoidable lateral motion of the cloth due to the action of the feed rollers 12. To this end I provide a bottomless casing 26 having the ends 28 and sides 30. A wire 32 is mounted centrally longitudinally thereof in the holes 34 made therefor in each end 28 of the casing 26. On said wire I mount a series of annular disc members 36, each being provided with a hollowed out central portion 38 so as to have individual relative up and down movement on said wire 32. To adjustably confine said disc members in free contiguous relationship on said wire, I provide on the inner end 28 of said casing an adjusting block 40; also slidable on said wire 32; and longitudinally adjustable by contact with the end of a thumb screw 42 mounted in a suitable hole therefor in the inner end 28 of said casing 26. The outermost disc 36 will bear against the outer end 28 of said casing; and as explained the discs are adjustably retained in contiguous free relationship between said outer end 28 and the block 40 which as explained is longitudinally adjustable by means of the thumb screw 42. A suitable bolt 44, having a threaded end 46 adapted to be threaded in a suitable hole therefor in the outer end of the casing 26, has its opposite end 50 mounted in a hole 52 therefor in the side of the frame, and is secured to said frame by the nut 54. Each side 30 of the casing 26 may be provided with the raised ribs 56, on which the casing cover 58 is adapted to rest. The casing cover 58 serves to prevent the liquid from being sprayed over the machine and cloth by the revolution of the annular discs 36. For purposes of assembly the casing 26 may be made in two portions, each including a side 30 and an end 28, secured together by the bolts 60. Though I have shown the wire 32 as a preferred means of mounting the annular metallic discs 36 over the ends of the holes in slotted member 16, it is obvious that any suitable means may be provided for this purpose, as well as any other suitable means other than those shown for longitudinally adjustably mounting the discs within the casing, and for mounting said casing 26 on the frame 10. Though I have shown the relatively movable metallic members 36 as comprising discs it is obvious that other suitable members circular or otherwise having relative up and down movement may be employed.

The operation of my invention is obvious from the above description. The material 14 spread out endwise is drawn over the slot 22 in the hollow member 16 as explained. The vacuum seals are so located relative to the ends of the slot, that some of the annular discs 36 will cover the selvage ends of

the cloth and also completely seal the ends of the slot 22 in the hollow member 16 exterior of said cloth 14. Both atmospheric pressure induced by the partial vacuum maintained in the slotted pipe 16 and the weight of the discs 36 themselves press the annular discs 36 firmly against the cloth 14 and slotted pipe 16. The cloth 14 in passing underneath the discs 36 lifts up certain of them a slight amount, said amount always being less than the length of the radius of the solid annular portions thereof and due to the atmospheric pressure induced and the weight of said metallic discs, they prevent air from rushing in underneath the lower surface of the cloth. As the cloth necessarily is moved sidewise by the action of the feed rollers 12, it is obvious that the individual discs 36 may be freely raised up by the cloth selvage when the cloth slides toward them and may drop down on the slot 22 as the cloth slides away from them, thus continually automatically maintaining the vacuum in the hollow pipe 16. Fig. 4 illustrates how, due to the annular shape of the metallic discs 36, they abut the slot 22 just sufficiently to seal said slot, and abut the cloth 14 only on a very small surface of their periphery to permit a maximum amount of hydro-extraction from the cloth. As the annular metallic discs are provided with the hollow central portions 38, it is obvious that they are permitted sufficient up and down relative movement on the wire 32 to permit them to move up and down as the cloth 14 sways sideways.

The discs 36 may be longitudinally adjusted, so as to have free up and down movement by means of the adjusting block 40 and thumb screw 42. When the adjusting block 40 is drawn to the inner end of the casing 26, it is obvious that the annular discs 36 may be suitably cleaned.

It is understood that my invention is not limited to the specific embodiment shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a machine for extracting liquid from cloth or other material, in combination, a suction pump, a hollow member connected to said suction pump having a longitudinal slot on the upper surface thereof, means for drawing the cloth spread out endwise over the slot in said member and combined gravity and atmospheric pressure actuated means for automatically sealing the vacuum between the ends of the slot in the slotted member and the selvages of the cloth, comprising a series of metallic annular discs mounted contiguously to each other to have individual up and down relative movement on frames attached to the machine over each

end of the slot in the slotted member so as to have the peripheries of some of said disks rest on the cloth for a distance near the end over the selvage edge thereof only and the peripheries of other adjacent disks rest for a distance beyond over the entire adjacent ends of the slotted member unsealed by the cloth.

2. In a machine for extracting liquid from cloth or other material, in combination, a suction pump, a hollow member connected to said suction pump having a longitudinal slot on the upper surface thereof, means for drawing the cloth spread out endwise over the slot in said member and combined gravity and atmospheric pressure actuated means for automatically sealing the vacuum between the ends of the slot in the slotted member and the selvages of the cloth without preventing lateral motion of the cloth, comprising a series of metallic annular discs mounted contiguously to each other to have individual up and down relative movement on frames attached to the machine over each end of the slot in the slotted member so as to have the peripheries of some of said disks rest on the cloth for a distance near the end over the selvage edge thereof only and the peripheries of other adjacent disks rest for a distance beyond over the entire adjacent ends of the slotted member unsealed by the cloth.

3. In a machine for extracting liquid from cloth or other material, in combination, a suction pump, a hollow member connected to said suction pump having a longitudinal slot on the upper surface thereof, means for drawing the material acted upon in open form over the slot in said member and combined gravity and atmospheric pressure actuated means for automatically sealing the vacuum between the ends of the slot in the slotted member and the ends of the material acted upon, comprising a series of metallic annular discs mounted contiguously to each other to have individual up and down relative movement on frames attached to the machine over each end of the slot in the slotted member so as to have the peripheries of some of said disks rest on the cloth for a distance near the end over the selvage edge thereof only and the peripheries of other adjacent disks rest for a distance beyond over the entire adjacent ends of the slotted member unsealed by the cloth.

4. In a machine for extracting liquid from cloth or other material, in combination, a suction pump, a hollow member connected

to said suction pump having a longitudinal slot on the upper surface thereof, means for drawing the material acted upon in open form over the slot in said member and combined gravity and atmospheric pressure actuated means for automatically sealing the vacuum between the ends of the slot in the slotted member and the ends of the material acted upon without preventing lateral motion thereof, comprising a series of metallic annular discs mounted contiguously to each other to have individual up and down relative movement on frames attached to the machine over each end of the slot in the slotted member so as to have the peripheries of some of said disks rest on the cloth for a distance near the end over the selvage edge thereof only and the peripheries of other adjacent disks rest for a distance beyond over the entire adjacent ends of the slotted member unsealed by the cloth.

5. A vacuum seal for hydroextractors, comprising a bottomless casing, a wire mounted longitudinally of said casing, a series of annular metallic discs mounted on said wire contiguously to each other having enlarged hollow central portions to permit individual up and down relative movement thereof on said wire and means to attach said casing to the frame of the machine.

6. A vacuum seal for hydroextractors, comprising a bottomless casing, and a series of annular discs mounted therein contiguously to each other having enlarged hollow central portions to permit individual up and down relative movement thereof.

7. A vacuum seal for hydroextractors comprising a hollow casing and a series of annular metallic discs mounted in said casing contiguously to each other to have individual up and down relative movement therein.

8. A vacuum seal for hydroextractors comprising a bottomless casing and a series of metallic members mounted contiguously to each other therein so as to have individual relative up and down movement.

9. A vacuum seal for hydroextractors comprising a bottomless casing, a wire mounted longitudinally of said casing and a series of metallic members mounted on said wire contiguously to each other having enlarged central portions to permit individual up and down relative movement on said wire.

In testimony whereof I affix my signature.

GEORGE W. VOELKER.