

Oct. 23, 1923.

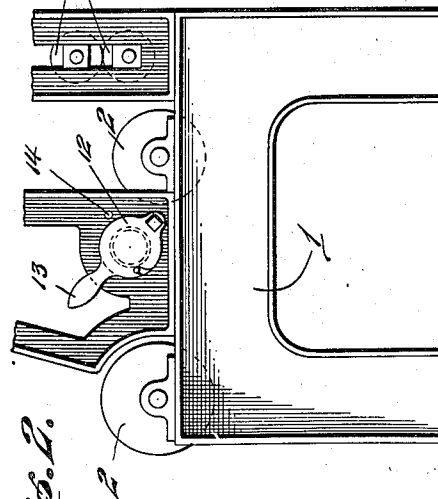
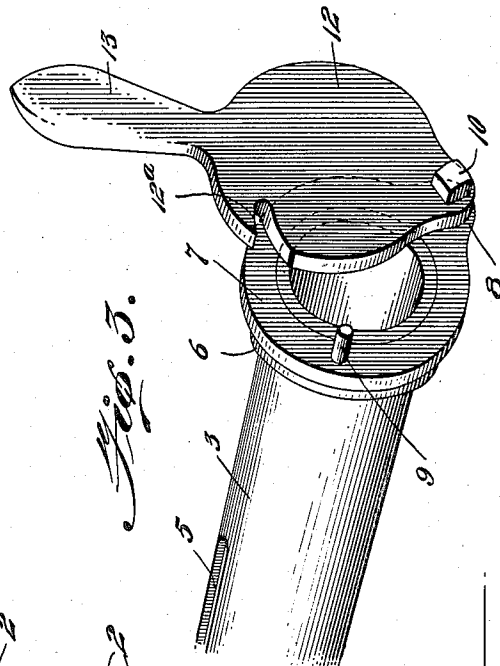
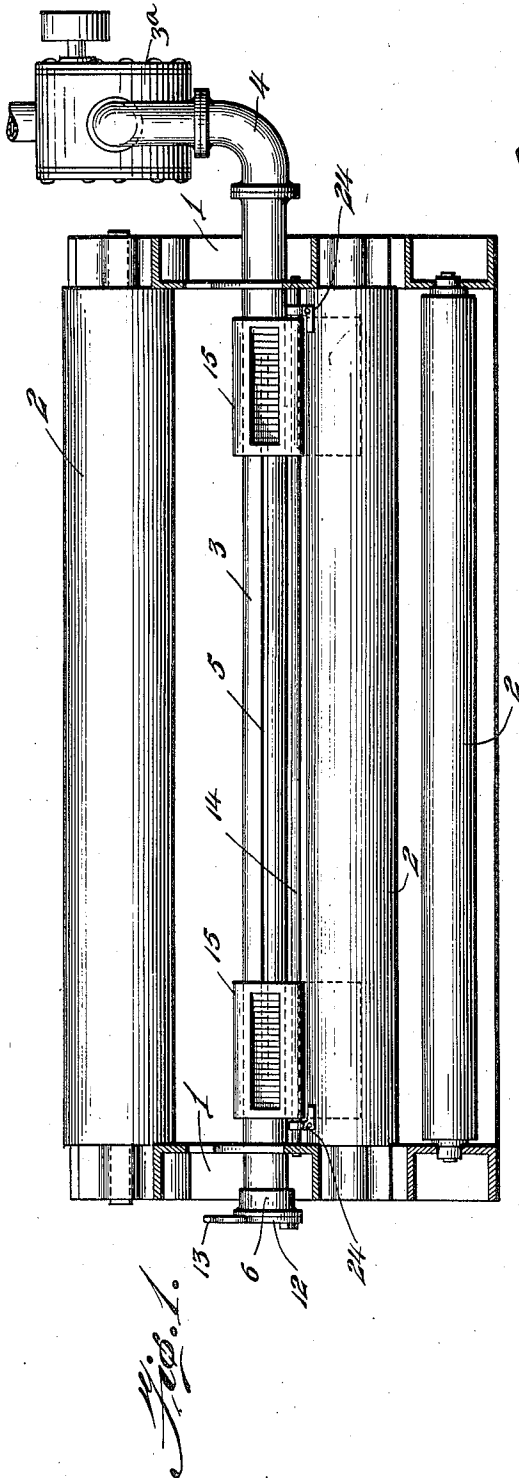
G. W. VOELKER

1,471,671

ATTACHMENT FOR SUCTION APPLYING MEMBERS OF VACUUM CLOTH HYDROEXTRACTORS

Filed June 21, 1922

2 Sheets-Sheet 1



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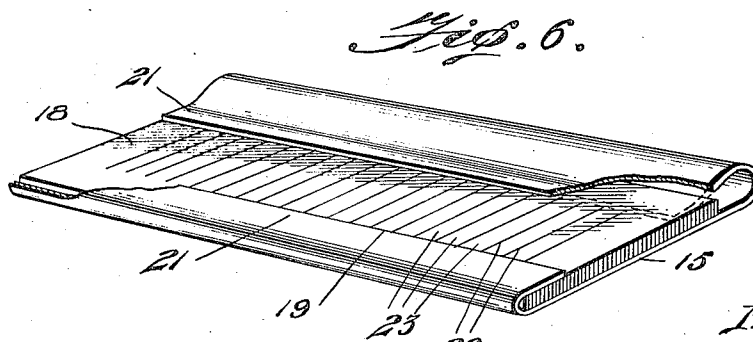
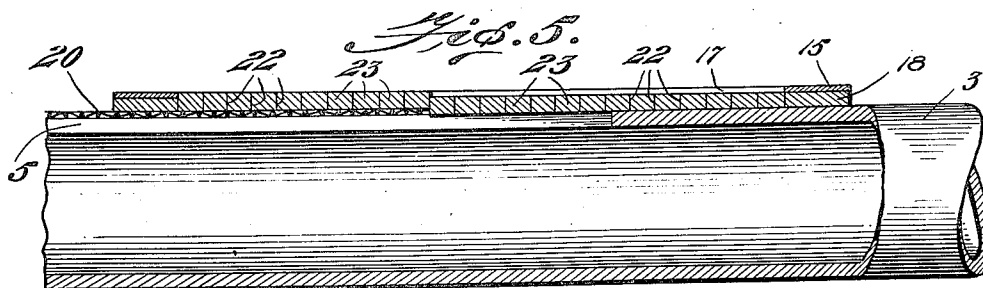
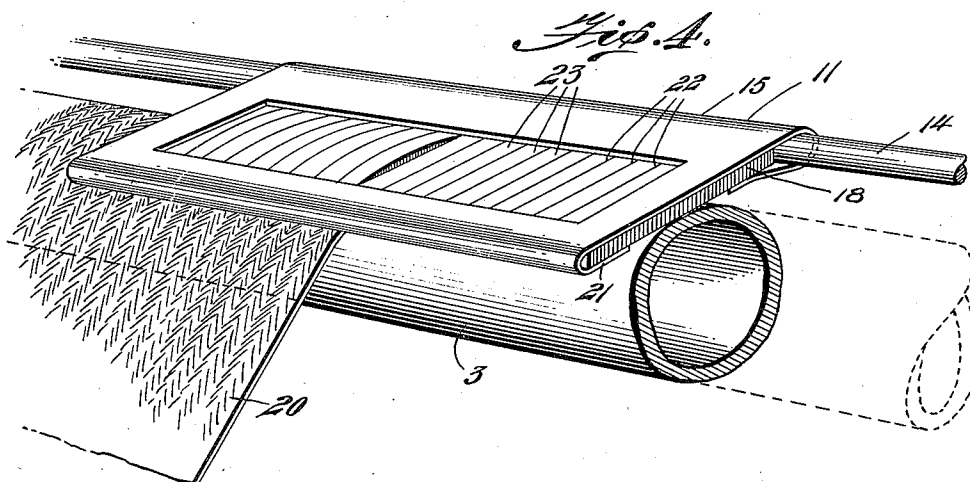
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George W. Voelker,
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Patented Oct. 23, 1923.

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UNITED STATES PATENT OFFICE.

GEORGE W. VOELKER, OF WOONSOCKET, RHODE ISLAND.

ATTACHMENT FOR SUCTION-APPLYING MEMBERS OF VACUUM CLOTH HYDRO-EXTRACTORS.

Application filed June 21, 1922. Serial No. 569,929.

To all whom it may concern:

Be it known that I, GEORGE W. VOELKER, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Attachments for Suction-Applying Members of 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 cloth support. The cloth passes over a slot in the top of said pipe. My improved slidable closure means for said pipe and automatic vacuum seal, my present invention, render it practicable to merely attach the opposite end of the slotted pipe to an ordinary suction pump. In this type of machine there is no cover above the cloth and slot, and the full weight of atmospheric pressure is rested on the cloth by means of the vacuum preserved in the chamber below, thereby greatly increasing the machine's drying efficiency. The slot extends substantially the length of the pipe between the sides of the frame. The cloth does not pass over the entire slot. One object of my invention is to effectually and automatically seal the ends of the slot over which the cloth does not pass by means of a pad made out of sheet rubber or other flexible material, attached to the frame of the machine, which pad covers each end of the slot and extends far enough towards the center of the slot to provide for materials of varying width to be passed over. This pad contains slits cut across it parallel to the direction in which the cloth is fed. The cloth in passing between the slotted pipe and sealing pad raises certain of the rubber strips between the slits. The atmospheric pressure pressing on the entire top surface of the pads effectually forces the portions of the pads under which the cloth does not pass against the slotted pipe, and also allows no air to penetrate under the lower surface of the cloth being treated. It is thus seen that as the portions of the slot extending beyond the selvages of the cloth are effectually sealed, the vacuum creating efficiency of the suction pump is greatly increased.

Another object of my invention is to provide means to keep ends of the slot at all

times perfectly sealed, and to allow for the sidewise motion of the cloth. With the method usually employed of feeding the cloth by grip rollers or otherwise over the slotted portion of the pipe, a sidewise motion of the cloth normally results. As before mentioned, the seal contains slits, and the cloth in passing through raises certain of the rubber strips between the slits. As the body is made of rubber or other flexible material, as the cloth slides sidewise in passing over the slotted pipe, these narrow rubber strips automatically slide down at once to seal the vacuum or are freely lifted by the cloth selvage, and the vacuum is always automatically maintained.

Another object of my invention is to provide a means for easing the starting of the suction pump. A slidable closure means is attached to the end of the slotted pipe away from the suction pump. The pump is started with no load at all, the slidable closure means is gradually operated until it closes the entire port in the end of the pipe. In this manner is the vacuum gradually established without too great an initial starting strain on the suction pump. This member may be opened, whenever desired, to quickly discharge the vacuum.

In the drawings Figure 1 is a plan view of part of a vacuum cloth hydro-extractor partially in section, showing the slotted pipe with its vacuum seals and slidable closure means.

Figure 2 is a fragmentary end view of the device shown in Figure 1.

Figure 3 is a detail perspective view of the slidable closure means.

Figure 4 is a detail perspective view of a seal, and the vacuum pipe, showing the cloth passing through.

Figure 5 is a longitudinal section of a seal and a portion of the vacuum pipe, the cloth being shown in position.

Figure 6 is an inverted perspective view of the seal partially broken away.

In the drawings, 1 is the frame of a vacuum cloth hydro-extractor, in which are mounted feed rollers 2 for drawing the cloth spread out endwise over the slotted pipe 3. The slotted pipe 3 is hollow and is the suction applying member of the hydro-extractor. It is mounted in the frame 1 of the hydro-extractor, and may be attached at one end to a suction pump 3^a by the pipe 4.

The hollow pipe 3 has on its upper surface over which the cloth is drawn the slot 5 which extends substantially its entire length. At the end of the slotted pipe 3 opposite the pipe 4 which leads to the suction pump 3^a is a slidable closure means. This comprises the flanged fitting 6 threaded on the end of the slotted pipe 3, and face 7 of which is smoothly surfaced and has on its outer periphery an extension 8, to which is pivotally mounted by the bolt 10, a closure 12 substantially disk shape and provided with the handle 13. The inner surface of the closure 12 is carefully finished for close engagement with the face 7 of the flanged fitting 6. The required friction between the closure 12 and the face 7 of the flange 6 is obtained by means of the bolt 10, threaded into the extension 8. The closure 12 is provided with the notch 12^a which is adapted to engage the pin 9 on the flange 6 to retain the closure 12 in closed position.

Extending between the sides of the frame 1 is means for mounting the sealing pads 18. This in the preferred form comprises a rod 14, suitably attached to the frame 1, on which are pivoted the sealing pad containers 15. These containers 15, in the preferred form, are made of suitable sheet metal, and have their longitudinal margins bent so as to form means for holding the sealing pads 18. The margin 11 is of substantially sleeve-shape formation to provide for pivotal mounting on the rod 14. These containers 15 have, on their upper surfaces, the cut out portions 17, so arranged that the sealing pad 18 may properly function, and are constructed so as to leave an open portion 19 on their lower surface to allow the under face of the sealing pad 18 to conveniently rest on the slotted pipe 3 and the cloth 20 without presenting any metal surface thereto. The sealing pad containers 15 are flattened out and contain flanges 21 on their lower face to retain the sealing pad 18 in proper position. The sealing pad 18 is made preferably of vulcanized rubber, but it is understood that any suitable flexible material be used. The preferred shape is rectangular to conveniently slide into the sealing pad container 15 and be held in position by the flanges 21 on its lower surface. It will be seen that as soon as the sealing pad wears out it may be removed from the container 15 and a new one inserted. For sealing engagement with the slotted pipe 3 and the cloth 20 the sealing pad 18 has a series of transverse slits 22 parallel to the direction in which the cloth is fed cut across the surfaces exposed in the cut out portion 17 and between the flanges 21 on its lower bearing surface. As readily seen, this provides flexible rubber strips 23 of depth corresponding to that of the sealing pad for active functioning with the slotted pipe 3

and cloth 20. The stops 24 attached to the bar 14 are adapted to prevent the containers 15 from contacting the feed roll 2 when the sealing pads 18 are not used and when they are thrown over to the position shown in dotted lines in Figure 1.

In operation, the suction pump 3^a is started, the slidable closure means 6 being open. There is no initial starting strain on the suction pump 3^a. As the pump 3^a gradually develops power, the plate 12 is slowly operated to cover the end of the pipe 3. In this manner a vacuum is gradually formed in the slotted pipe 3 without a great initial strain on the suction pump 3^a. Thus a relatively small horse-power suction pump may be used. When the member 12 is in fully closed position its finished surface co-acts with the finished face 7 to form a hermetic seal. As stated, this member may also be used at any time to quickly release the vacuum. When the vacuum is developed in the hollow slotted pipe 3, the feed rollers 2 are started up, and the cloth 20 is fed over the slot 5 in the slotted pipe 3. A partial vacuum is created by the suction pump 3^a in the pipe 3 and atmospheric pressure bears down on the upper surface of the cloth 20. This extracts a large percentage of the moisture out of the cloth, which moisture is drawn out by the suction pump 3^a. The vacuum sealing pads 18 held in position as shown at each end of the slot 5, effectually seal the portion of the slot 5 not covered by the cloth 20 as follows. The cloth or material 20 passes over the slotted pipe 3, and each end or selvedge thereof passes underneath the sealing pads 18, as shown in Figures 4 and 5. Atmospheric pressure, induced by the partial vacuum maintained in the slotted pipe 3 below, presses the sealing pads 18 firmly against the cloth 20 and slotted pipe 3. The cloth 20 in passing underneath the sealing pads 18 lifts certain of the flexible rubber strips 23 between the slits 22, and as their depth is great enough to allow for the thickness of the cloth 20, they prevent air from rushing in underneath the lower surface of the cloth. As also stated, as these rubber strips 23 are flexible they allow free play for the sidewise motion of the cloth, and automatically are forced down at once to seal the vacuum when the cloth 20 slides in the opposite direction, or as they are flexible, they are freely lifted by the cloth selvedge when the cloth slides towards them, and a vacuum is thus automatically maintained.

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 slotted member connected to a suction pump adapted to apply the suction to the material acted upon, means for drawing said

material in open form over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump, and to be opened when desired to release the vacuum, and means for automatically sealing the vacuum between the ends of the slot and the material acted upon.

2. In a machine for extracting liquid from cloth, in combination, a suction pump, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump, and to be opened when desired to release the vacuum, and means for automatically sealing the vacuum between the ends of the slot in the slotted member and the selvages of the cloth.

3. In a machine for extracting liquid from cloth or other material, in combination, a slotted member connected to a suction pump adapted to apply the suction to the material acted upon, means for drawing said material acted upon in open form over the slot in said member, and means for automatically sealing the vacuum between the ends of the slot and the material acted upon.

4. In a machine for extracting liquid from cloth, in combination, a suction pump, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, and means for automatically sealing the vacuum between the ends of the slot in the slotted member and the selvages of the cloth.

5. In a machine for extracting liquid from cloth or other material, in combination, a slotted member connected to a suction pump adapted to apply the suction to the material acted upon, means for drawing said material acted upon in open form over the slot in said member, and slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump, and to be opened when desired to release the vacuum.

6. In a machine for extracting liquid from cloth, in combination, a suction pump, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, and slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump and to be opened when desired to release the vacuum in said slotted member.

7. In a machine for extracting liquid from cloth or other material, in combination, a slotted member connected to a suction pump adapted to apply the suction to the material

acted upon, means for drawing said material in open form over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump, and to be opened when desired to release the vacuum, and means for sealing the vacuum between the ends of the slot and the material acted upon.

8. In a machine for extracting liquid from cloth, in combination, a suction pump, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump, and to be opened when desired to release the vacuum, and means for sealing the vacuum between the ends of the slot in the slotted member and the selvages of the cloth.

9. In a machine for extracting liquid from cloth or other material, in combination, a slotted member connected to a suction pump adapted to apply the suction to the material acted upon, means for drawing said material in open form over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the suction pump, and to be opened when desired to release the vacuum, means for automatically sealing the vacuum between the ends of the slot and the material acted upon, without preventing lateral motion of the material acted upon.

10. In a machine for extracting liquid from cloth, in combination, a suction pump, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, slidable closure means attached to said member, adapted to be slowly shut to ease the starting action of the suction pump and to be opened when desired to release the vacuum, 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.

11. In a machine for extracting liquid from cloth or other material, in combination, a slotted member connected to a suction pump adapted to apply the suction to the material acted upon, means for drawing said material acted upon in open form over the slot in said member, means for automatically sealing the vacuum between the ends of the slot and the material acted upon, without preventing lateral motion of the material acted upon.

12. In a machine for extracting liquid

from cloth, in combination, a suction pump, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, 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.

13. In a machine for extracting liquid from cloth or other material, in combination, a slotted member connected to a vacuum developing mechanism adapted to apply the suction to the material acted upon, means for drawing said material in open form over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the vacuum developing mechanism, and to be opened when desired to release the vacuum, and means for automatically sealing the vacuum between the ends of the slot and the material acted upon.

14. In a machine for extracting liquid from cloth, in combination, a vacuum developing mechanism, a hollow slotted member connected therewith adapted to apply the suction to the cloth, means for drawing the cloth spread out endwise over the slot in said member, slidable closure means attached to said member adapted to be slowly shut to ease the starting action of the vacuum developing mechanism and to be

opened when desired to release the vacuum, and means for automatically sealing the vacuum between the ends of the slot in the slotted member and the selvages of the cloth.

15. A slidable closure means for the hollow slotted suction applying members of vacuum cloth hydro-extractors of the character described, comprising a plate pivoted at one end of the suction applying member, the opposite end of which is attached to a vacuum developing mechanism and means whereby the plate may be opened and shut.

16. A vacuum seal for hydro-extractors of the character described, comprising means for attaching the same to the frame of the machine, means cut away at the top and bottom for containing a flexible member, and a flexible member having transverse slits therein parallel to the direction of the cloth in passing through the machine.

17. A vacuum seal for hydro-extractors of the character described, comprising a metal container and support, and a flexible body, having slits therein.

18. A vacuum seal for hydro-extractors of the character described, comprising a flexible member, retaining means for said flexible member constructed to permit said flexible member to rest on the cloth and means for attaching said means to the frame of the machine.

In testimony whereof I affix my signature.
GEORGE W. VOELKER.