

Jan. 13, 1931.

A. BIRCH

1,789,132

MACHINE FOR EXTRACTING FLUID FROM CLOTH OR OTHER MATERIAL

Filed May 31, 1930

2 Sheets-Sheet 1

Fig.1.

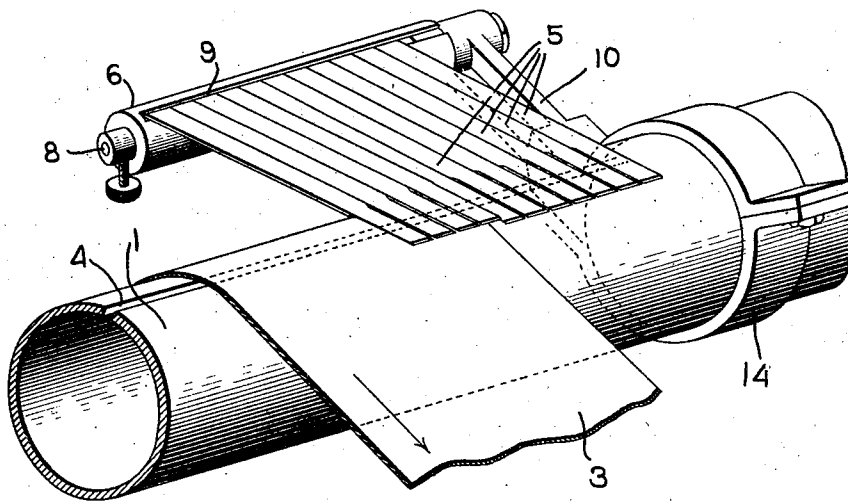


Fig.2.

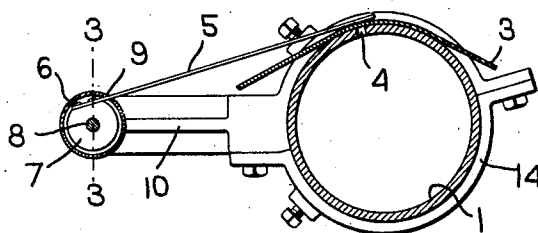


Fig.3.



Fig.4.

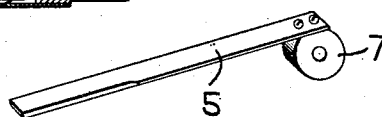
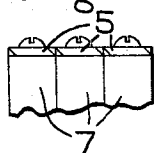


Fig.5.



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2 Sheets-Sheet 2

Fig. 6.

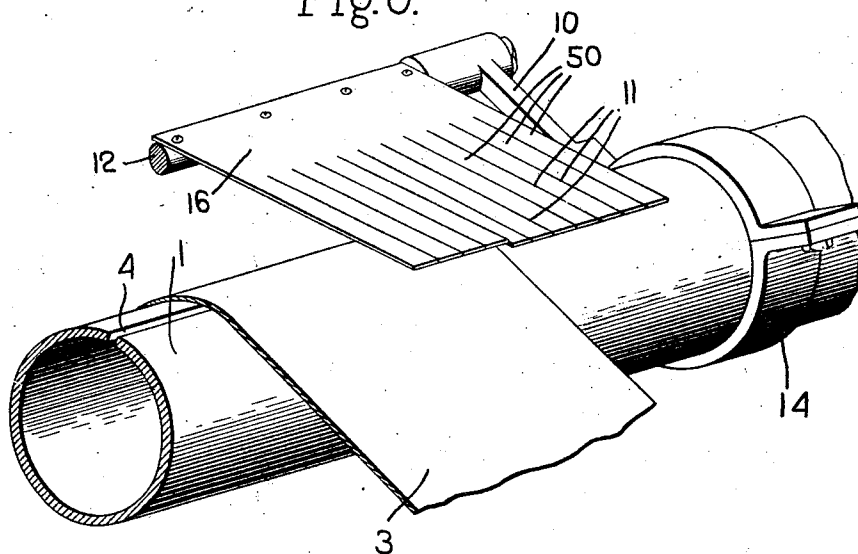


Fig. 7.

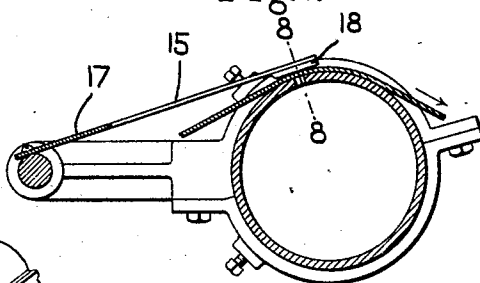


Fig. 9.

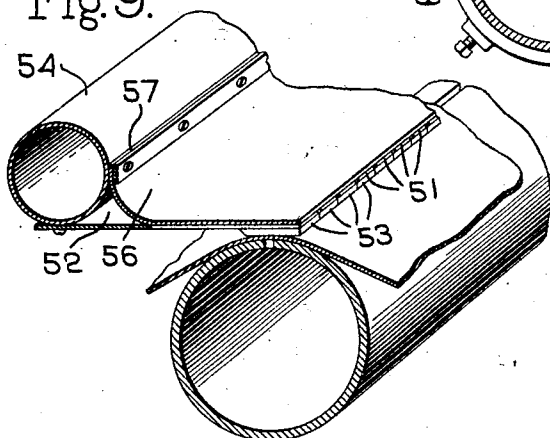
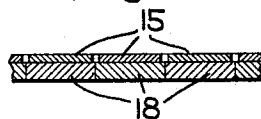


Fig. 8.



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UNITED STATES PATENT OFFICE

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MACHINE FOR EXTRACTING FLUID FROM CLOTH OR OTHER MATERIAL

Application filed May 31, 1930. Serial No. 458,815.

This invention relates to a machine for extracting liquid or fluid from cloth or other web material and particularly to a machine of the so-called "vacuum hydro extractor" type. These machines are usually provided with a tube or pipe over which the cloth passes and which is provided with one or more slots so that as the cloth is drawn over the pipe it will pass across the slot or slots.

The pipe or tube is connected to a vacuum or suction device by means of which vacuum conditions are created within the tube. As a result the vacuum within the tube will act on the portion of the cloth which spans the slot or slots of the tube thereby sucking or drawing the water or other fluid from the cloth, the fluid being deposited in the tube and being removed either by drainage or by means of the suction device.

In these machines the cloth is often of less width than the length of the slotted portion of the tube so that the extremities of the slotted portion are beyond the edges of the cloth. The present invention relates particularly to a novel means for automatically closing these uncovered portions of the slot or slots.

The features wherein the invention resides will be more fully hereinafter set forth and then pointed out in the appended claims.

In the drawings:

Fig. 1 is a fragmentary sectional view illustrating a portion of a vacuum tube of a hydro extractor and showing one form which my invention may assume;

Fig. 2 is a transverse section through Fig. 1;

Fig. 3 is a section on the line 3—3, Fig. 2;

Fig. 4 is a view of one of the slot-closing fingers;

Fig. 5 is an end view of the fingers;

Fig. 6 is a view similar to Fig. 1 but showing a different embodiment of the invention;

Fig. 7 is a transverse section through Fig. 6;

Fig. 8 is a section on the line 8—8, Fig. 7.

Fig. 9 is a fragmentary perspective view showing a different embodiment of the invention.

Inasmuch as the present invention relates

simply to the means for closing the slot or slots of the vacuum tube which are exposed beyond the edges of the cloth I have not found it necessary to illustrate a complete machine but have shown only a sufficient portion thereof to enable the invention to be understood.

In Figs. 1 and 2, 1 indicates the vacuum tube over which the cloth 3 is passed, said tube having one or more slots formed therein so situated that the cloth passes over the slotted portion of the tube. The tube may have one or a plurality of slots and the slots may have any desired arrangement so long as they are located in the portion of the tube with which the cloth engages as it is moved forward. In the particular construction shown the tube is provided with a single slot 4 extending longitudinally thereof.

This tube is shown as supported in suitable brackets or supports 40 which are carried by the machine and it will be understood that it is connected to a suitable suction apparatus so that vacuum conditions will be created within the tube.

The slot or slots in the tube may extend beyond the edges of the cloth from which the fluid is being extracted, in which case the ends of the slot or slots will be exposed beyond the edges of the cloth.

As stated above, my present invention relates to a novel means for automatically closing the exposed portions of the slot or slots. In the construction shown in Figs. 1 to 5 this is accomplished by means of slot-closing fingers 5 in the form of strips of suitable material which are supported at one end in a suitable support 6 and at their other end rest on the tube and close the slot thereof. As the cloth is drawn over the tube 1 the edges of the cloth will pass under certain of the slot-closing fingers thereby raising them slightly from the tube but the fingers which are outside of the edge of the cloth will maintain the exposed portion of the slot or slots closed.

In the construction shown in Figs. 1 to 5 each finger is secured to a hub portion 7 and these hubs are situated within the tubular support 6 and are loosely mounted on a rod 8 which extends axially of the tubular sup-

port 6. This support 6 is provided with a longitudinal slot 9 through which the fingers 5 extend. The tubular member 6 is shown as carried by a bracket arm 10 extending from the support 4 for the vacuum tube. With this construction the fingers 5 are capable of independent movement so that the particular fingers under which the cloth 3 passes are free to be raised slightly to permit the cloth to pass freely while the remaining fingers will lie against the vacuum tube 1 and close the slot 4 thereof.

If, during the movement of the cloth in the direction of the arrow, said cloth has any lateral shifting movement toward the end of the slot, it will automatically work its way beneath and raise another finger, the remaining fingers still functioning to close the exposed portion of the slot. On the other hand, if, during the travelling movement of the web of cloth 3, it moves toward the left in Fig. 1 so as to uncover more of the slot any finger from under which the cloth may be withdrawn will automatically drop into position to close the additional portion of the slot which is thus uncovered.

In Figs. 6 and 7 I have shown a somewhat different embodiment of the invention. In this construction the various slot-closing fingers, which are indicated at 50, are integrally connected together, they being formed from a piece of sheet material 16 by slitting the same as indicated at 11. These slits extend from the edge of the sheet part way toward the opposite edge. The connected gang of fingers 50 is illustrated as secured to a supporting rod 12 which is carried by the bracket arm 10 extending from the support 14 for the vacuum tube 1.

In order to prevent the slot-closing fingers from catching on each other as they are raised or lowered due to any shift in the position of the edge of the cloth, I propose to make the slot-closing end of the fingers so that they will have a vertical dimension greater than any vertical movement which they will have during the operation of the machine. This may be readily accomplished by making the end portion of each finger considerably thicker than the body thereof as shown at 15. This is shown in Fig. 7 where the individual fingers are indicated at 15, they being formed as shown in Fig. 6 by making slits in a piece of sheet material 17. Where the fingers are thus formed from sheet material the added thickness may be provided by securing a block 18 to the end of each finger 15. These blocks will have a vertical dimension greater than any vertical movement which the fingers may have in the normal operation of the machine.

I propose to make each block 18 slightly wider than the corresponding finger, the extra width being sufficient to make up for the width of the slits 11 and with this construc-

tion the side faces of adjacent blocks will engage each other so there will be no cracks or spaces between the portions of adjacent fingers that overlie the slot 4. With such a construction there will be more uniform extraction of the fluid from the cloth than where the spaces exist between adjacent fingers.

In Fig. 9 I have shown a still different embodiment of the invention. In this construction the slot-closing fingers are indicated at 51 and they are constructed as shown in Fig. 7, they being formed by slitting a piece of sheet material 52 and each finger having a block 53 secured thereto at its end to provide the desired added thickness at this point. In this embodiment the sheet material 52 is secured at its non-slitted end to the under side of a tube 54 which is suitably supported in brackets or arms.

In this embodiment a flexible flap member 56 of rubber, rubberized cloth or similar material overlies the fingers, said flexible flap member being secured at one edge to the tube 54 as shown at 57. This flap member applies a certain amount of weight to the fingers to retain them firmly against the cloth and it also serves to close any cracks or spaces that might exist between the fingers and thereby secures more uniform extraction of moisture.

Where the slot-closing fingers are situated at the ends of the tube only as shown in Figs. 1 and 6 the two edges of the cloth will pass under some of the fingers while the center portion of the cloth is entirely exposed. With such an arrangement the fluid is likely to be extracted to a different extent from the portion of the cloth that is exposed from what it is in the portion of the cloth covered by the fingers. It is within my invention to place the fingers throughout the full length of the vacuum tube 1 and where this is done the fluid will be uniformly extracted from the cloth throughout its entire width.

The construction of fingers shown in Figs. 7 and 9 has the advantage that since the adjacent fingers are in contact with each other the effect on the cloth is the same as if it were drawn under a solid sheet of metal and even a cloth of delicate texture can be passed under the fingers without any marks or streaks left thereon by the individual fingers.

I claim.

1. In a machine for extracting fluid from cloth, the combination with a vacuum tube provided with a slot over which the cloth to be treated is drawn, a supporting member situated in the rear of said tube, a plurality of independently movable slot-closing fingers carried by said supporting member and having their free ends resting on the tube at the slotted portion thereof and normally closing the slot.

2. In a device of the class described, the combination with a vacuum tube having a slot, a support for said tube, a bracket ex-

tending from said support, a plurality of slot-closing fingers mounted on the bracket and having their free ends overlying the slot of the vacuum tube.

5 3. In a machine for extracting fluid from cloth, the combination with a vacuum tube provided with a slot over which the cloth to be treated is drawn, a supporting member situated in the rear of said tube, a plurality
10 of independently movable slot-closing fingers carried by said supporting member and having their free ends resting on the tube at the slot thereof and normally closing the slot, the free end of each slot-closing finger having a
15 vertical dimension greater than any vertical movement which the finger has in operation of the machine.

In testimony whereof, I have signed my name to this specification.

ALBERT BIRCH.