No. 883,536. PATENTED MAR. 31, 1908.

E. GESSNER.

MACHINE FOR EXTRACTING LIQUID FROM CLOTH.

APPLICATION FILED FEB. 28, 1906.

5 SHEETS—SHEET 1.

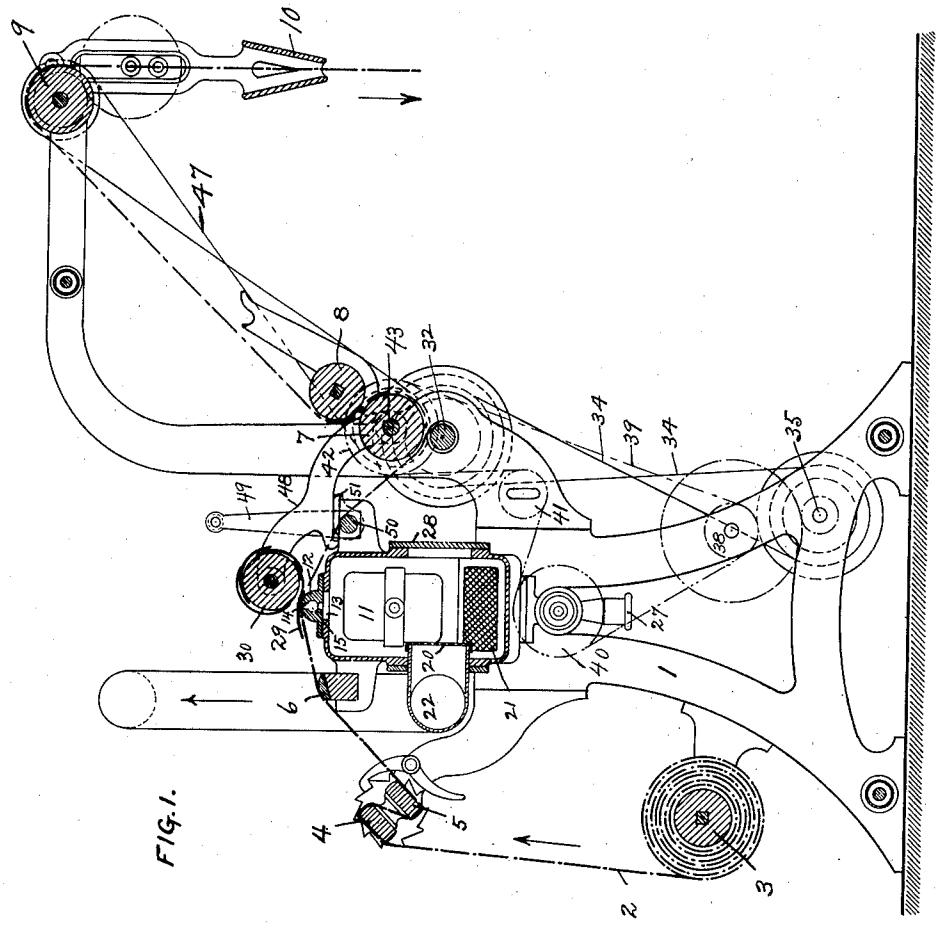


FIG. 1.

WITNESSES:

W. A. Pauling

Jos. J. Pierando

INVENTOR;

Ernst Gessner

by Hyperts / Thee ATT'YS.

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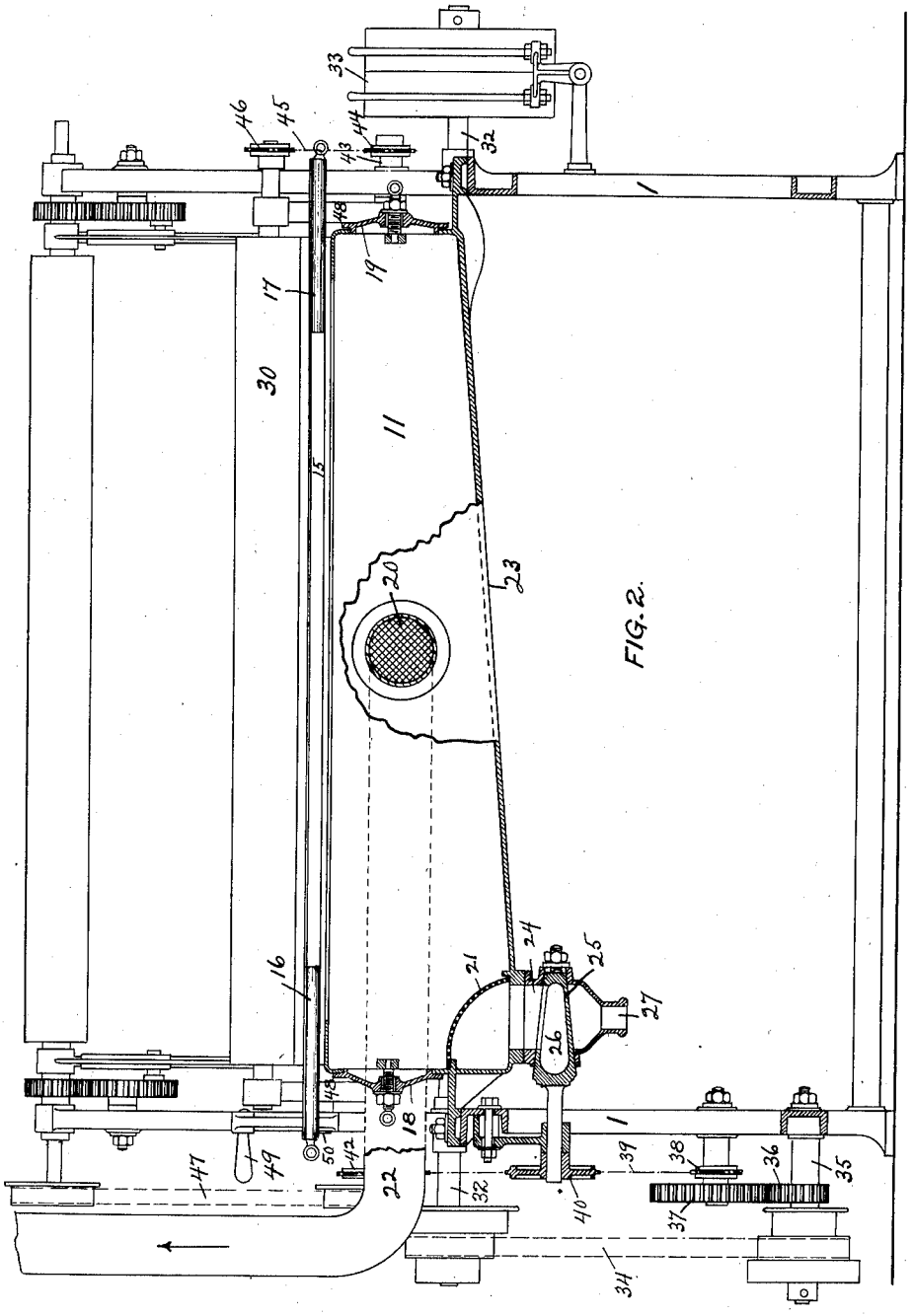


FIG. 2.

WITNESSES:

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5 SHEETS—SHEET 3.

FIG. 3

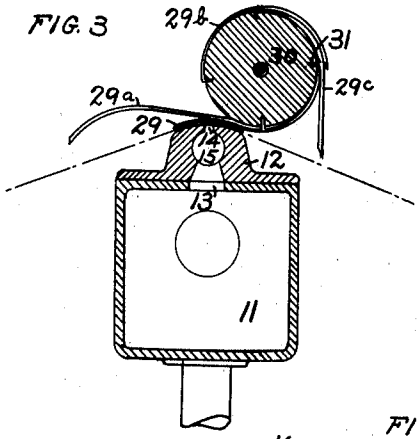


FIG. 4

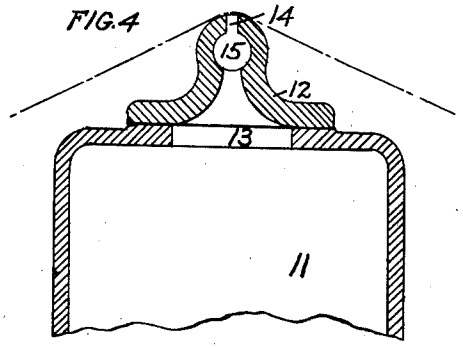


FIG 5

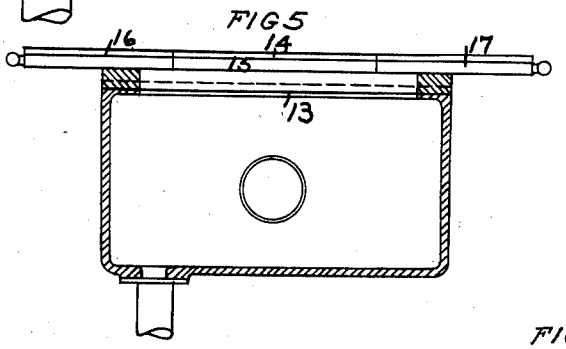


FIG. 6

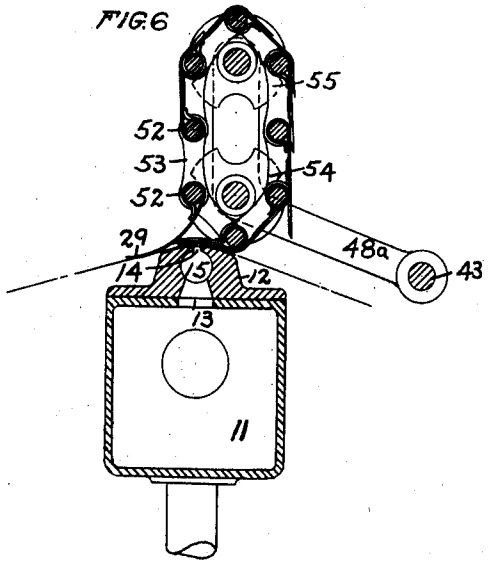
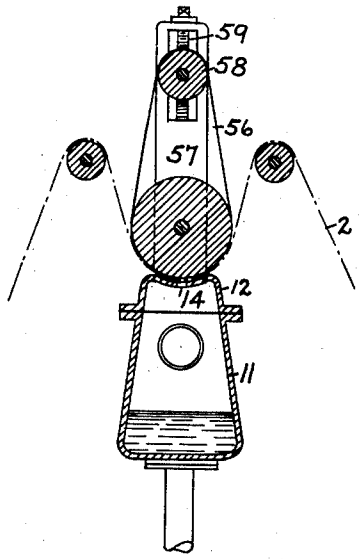


FIG. 7



WITNESSES

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5 SHEETS—SHEET 4.

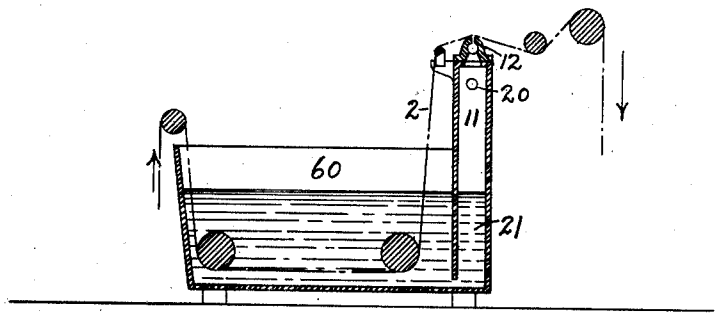


FIG. 8

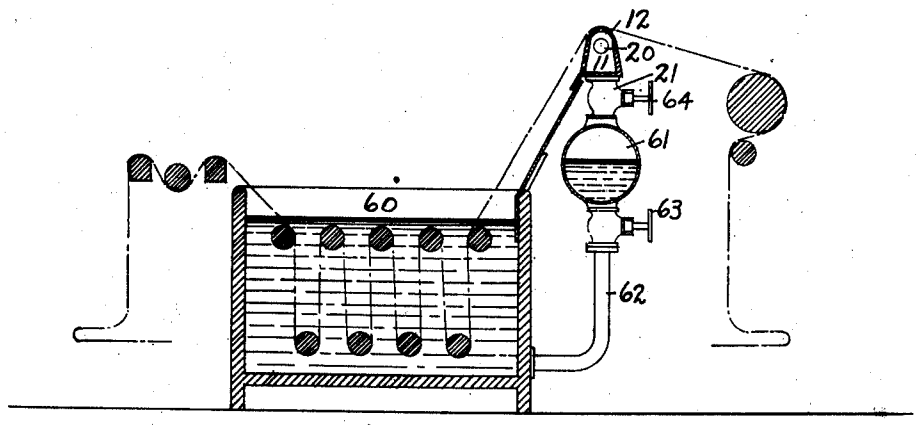


FIG. 9

WITNESSES
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MACHINE FOR EXTRACTING LIQUID FROM CLOTH.

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5 SHEETS—SHEET 5.

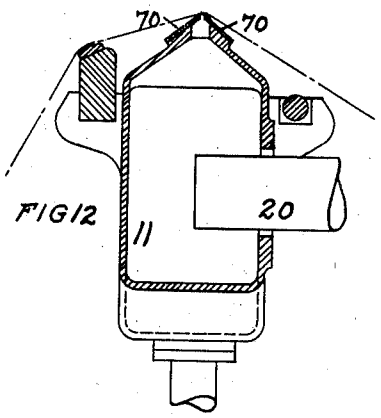


FIG 12

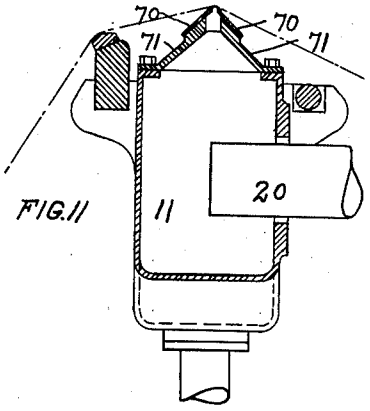


FIG. 11

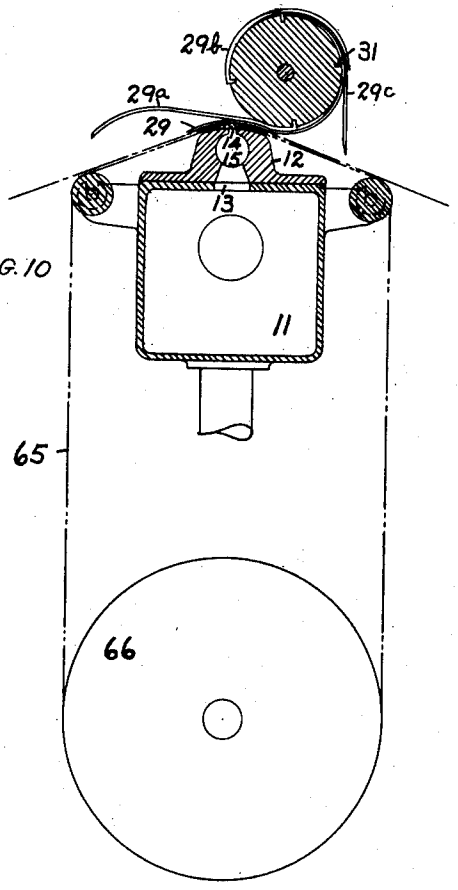


FIG. 10

WITNESSES

W. C. Pauling

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UNITED STATES PATENT OFFICE.

ERNST GESSNER, OF AUE, GERMANY.

MACHINE FOR EXTRACTING LIQUID FROM CLOTH.

No. 883,536. Specification of Letters Patent. Patented March 31, 1908.

Application filed February 28, 1906. Serial No. 303,358.

To all whom it may concern:

Be it known that I, ERNST GESSNER, a subject of the Emperor of Germany, and a resident of Aue, Kingdom of Saxony, Empire of Germany, have invented a Machine for Extracting Liquid from Cloth, of which the following is a specification.

The object of this invention is a machine which will extract the maximum quantity of water from cloth intermediate the washing and drying operations.

Among the advantages of this machine, I may state that liquid may be extracted thereby uniformly and continuously; that it may be accomplished without wrinkling or creasing the cloth; that the varieties of cloth to which it is applicable are almost unlimited, including plush, velvet, skin imitations and face goods, also carbonized goods; that in the case of face goods, the face is left in better condition; that foreign substances and flocks are removed; that a very large percentage, reaching as high, in some goods, as 60%, of the liquid, is removed making the subsequent drying operation much more economical; that the operation is simpler, less laborious and accompanied by less danger to the attendants.

In the accompanying drawings, Figure 1 is a cross section of the machine. Fig. 2 is a longitudinal section of the same. Fig. 3 is a detail showing a section of the cloth holder and one form of cover and the parts by which they are respectively supported. Figs. 4 and 5 are a cross and longitudinal section of the cloth holder and vacuum chamber showing the means by which the length of the slot may be adjusted to suit different widths of cloth. Figs. 6 and 7 are details of modifications. Figs. 8 and 9 are diagrammatic representations of the application of my machine in such manner that the extracted liquid will run back into the vat in which the cloth is soaked. Fig. 10 is a further modification in which an endless apron is provided to run between the cloth and the cloth-rest or support. Figs. 11 and 12 are details showing two different ways of constructing the vacuum chamber in one of which (Fig. 12) the chamber is made in one part, and in the other of which (Fig. 11) the top of the chest 71 is made separate from the body and bolted thereto.

1, 1, are the end frames of the machine.

2, is the cloth being treated.

3, is the roll upon which the cloth is received from the washing machine in dripping wet condition. This roll 3 is mounted upon the frame, as shown, and thence the cloth travels around the tension bars 4, 5, over the spreader bar 6, over the water extracting apparatus, hereinafter described, around the draft-roll 7, around the lap-roll 8 upon which it may be wound, if desired, or from which it otherwise may continue over the folder-roll 9 and down through the folder 10 by which it is folded preparatory to being taken to the drying machine, which is preferably of the form shown in U. S. Letters Patent No. 754,649 dated March 15, 1904.

The water extracting apparatus consists of an air and water exhaust on one side of the cloth and a cover upon the opposite side of the cloth, and different parts of my invention relate not only to the combination of the two but to the novel features of each.

11 is a vacuum chamber of the proportions shown upon which is mounted a cloth rest 12. A slot 13 extends through the top of the vacuum chamber and through the cloth-rest so as to present a slotted suction mouth 14 to the cloth.

15 is a longitudinal slideway intercepting this slot in which are slidably mounted the slides 16 and 17 by which the operative length of the slot may be varied by the attendant at will to suit the width of the cloth being treated. The opposite ends of the vacuum chamber 11 are preferably provided with the removable heads 18 and 19 to give access to the interior.

There are two ports leading from the vacuum chamber 11—an air exhaust port and a liquid exhaust port numbered respectively, 20 and 21—each of which is preferably protected by a suitable perforated screen or gauze, as shown. The air exhaust port 20 is located above the bottom of the vacuum chamber so as to be above any liquid that may accumulate in the bottom of the chamber, and the air exhaust is produced by any suitable air exhaust apparatus or pump connected with the exhaust or suction pipe 22. The liquid exhaust-port is located at the bottom of the vacuum chamber and in order that the liquid may flow by gravity to the liquid exhaust-port, the bottom 23 of the vacuum chamber is preferably given a downward inclination toward said liquid exhaust-port 21.

The liquid exhaust-port is provided with a sealed liquid discharge; or, in other words,

one which will discharge the water without substantially interfering with the maintenance of the vacuum or partial vacuum within the vacuum chamber. This water discharge in the form shown in the drawings consists of an outlet passage 24 which is intercepted by a valve or cock 25 that contains an internal chamber 26 open on one side only of the cock. When this cock is in the position shown in Fig. 2, it receives the liquid from the vacuum chamber 11 without admitting air thereto and when the cock 25 is turned, it still prevents the admission of air to the chamber 11 while discharging through the spout or outlet 27.

In the drawings, the port 20 is shown about the middle of the front of the vacuum chamber 11 and opposite it is shown a removable plate 28. The exhaust liquid port is shown at one end of the vacuum chamber at the bottom below the opening protected by the head 18. By this arrangement, the attendants can not only get at the ports conveniently, but can admit sufficient light to the vacuum chamber through the end openings 18 and 19 to properly attend to any operations that are necessary for cleaning or otherwise treating the interior of the chamber.

The cover may be of either of the forms shown in detail in Figs. 3, 6 or 7, but in practice, I prefer the forms shown in Figs. 3 and 6 and of these two, I prefer the form shown in Fig. 3, which I will therefore first describe. The cover consists of a flexible sheet 29 extending across the machine from end to end of the slot 14 and therefore extending beyond the edges of the cloth being treated. This flexible sheet is of such material that it will adapt itself to the upper surface of the cloth and under the suction in the slot 14 will hug the cloth against the cloth rest 12 and also hug the surface of the cloth rest itself throughout the length of the slot beyond the edges of the cloth so as to prevent the entrance of any air into the vacuum chamber excepting such as may pass through the fibers of the cloth which are being hugged between the cover and the cloth rest. For this purpose, the material that I prefer for the flexible cover 29 is enameled cloth or oil cloth or rubber coated cloth, being substantially impervious to air; but I do not wish to limit myself to either of these kinds of cloth or to a cover which is entirely impervious to air since I am aware that approximately good results may be obtained by a flexible cover which admits air to some extent.

In the form shown, I have provided the following means for causing the cover to travel with the cloth. 30 is a carrier which in the form shown in Fig. 3 consists of a rotated cylinder upon the periphery of which is mounted a series of the covers referred to designated as 29, 29^a, 29^b, 29^c. Each of these covers is secured to the periphery of the carrier at one edge of the cover only, as, for instance, at the edge 31 of the cover 29; the body and opposite edge of the cover being free and each cover being wide enough to overlap the cover succeeding it. By this arrangement, before one cover, as 29, has been carried beyond the slot 14, the next cover, 29^a, is in position to cover the slot so that there is no intermission between the action of succeeding covers. The atmospheric pressure upon the top of each cover in turn presses the cover upon the cloth-rest and cloth.

The parts are driven as follows: 32 is the prime moving shaft driven by the belt pulley 33. From this shaft the belt 34 drives the shaft 35 from which is driven the sprocket 38 through the gears 36 and 37. A chain 39 extends from the sprocket 38 around the sprocket 40 on cock 26, under the chain tightener 41 and around the sprocket 42 fast to the shaft 43 of the draft roll 7. The sprocket 44 fast on the shaft 43 drives through the chain 45 the sprocket 46 fast on the shaft of the cover carrier 30. The parts are so proportioned that the draft-roll 7 draws the cloth forward at the same speed that the carrier 30 draws the cover 29 forward and, therefore, the unison of motion between the cloth and the series of covers 29 is secured which prevents undue strain being exerted upon the cloth. The belt 47 drives the folding mechanism in a well known manner.

By the connections above described, as the cloth is fed forward, the cock 26 will be constantly turned so as to, at regular intervals, empty itself of the water drained into it from the vacuum chamber 11 without destroying the vacuum or partial vacuum in said chamber.

In order to provide for inserting the cloth into the machine, I provide the following mechanism for raising the cover carrier-roll 30: The bearings of this roll are mounted in arms 48 which are pivoted concentric with the shaft 43 of the draft-roll 7. Beneath one of these arms is pivoted the hand lever 49 at 50, which lever is provided with a cam projection 51 operating against the under side of the arm 48 so that when this lever 49 is moved by hand forward, it will raise the cover carrier 30 to permit the introduction of the cloth. By the backward movement of the lever 49, the cover carrier is returned to its normal operative position slightly above the cloth so as to permit the covers to rest upon the surface of the cloth. It will be observed that the cover carrying roll 30 is held slightly offset at the back of the cloth holder 12 so that the successive covers 29 are free of the carrier roll 30 when covering the slot.

In the modification shown in Fig. 6, the cover carrier instead of being in the form of a cylinder consists of a series of rods 52 linked together by a chain 53 and carried upon the sprockets 54 and 55. Each of the rods 52 carries one edge of one of the covers 29 and the journals of the sprockets are mounted in an arm 48ª having the same mode of operation as the arm 48 already described. One of the sprockets, 54, is driven from the shaft 43 of the draft-roll 7, as in the form of carrier shown in Figs. 1 and 2.

In the modification shown in Fig. 7, I have substituted for the covers 29, a cover 56 consisting of an endless apron wide enough to extend the whole length of the slot 14 and resting against the opposite side of the cloth 2 from the slot 14. The top of the cloth rest 12 in this case is made concave so as to conform to the surface of the endless apron cover 56. Therefore, in this modification, as also in the forms shown in Figs. 3 and 6, the cover conforms to the surface of the cloth-rest or support 12 adjacent to the exhaust passage 14 and enables the cover to act as a compress in opposition to the upper surface of the cloth-rest or support 12 throughout a substantial area of that surface on both sides of the exhaust passage 14. The endless apron cover is, in this case, carried by the cylinders 57 and 58 arranged vertically above the slot 14. An adjustment 59 is provided to hold this apron 56 taut and it is driven at a surface speed corresponding to the feed of the cloth by a driving mechanism operating upon the roll 57 substantially in the same manner as the carrier-roll 30 is driven in the form shown in Figs. 1 and 2.

In Fig. 10, the modification of Fig. 3 consists in the addition of the endless apron 65 running between the cloth and the cloth support 12. This endless apron will be of comparatively open textile material so that it does not substantially interfere with the action of the exhaust while at the same time acting to relieve the cloth from friction between the cloth and the surface of the cloth-rest 12. This endless apron will preferably be driven by suitable means at the same surface speed with the cloth. The cloth is passed through the machine preferably face upward.

In Fig. 8, the cloth-rest or support 12 is shown as mounted upon the top of a vacuum chamber 11 from which lead the air exhaust-port 20 and the liquid exhaust-port 21 which connects with the body of a vat 60 in which the cloth is being immersed and soaked on its way to the cloth support 12.

In Fig. 9, between the liquid exit 21 from the vacuum chamber 11 and the vat 60 is placed an intermediate chamber or reservoir 61 wherein the liquid is permitted to accumulate before being discharged into the vat through the passage 62; a valve 63 being placed in said passage 62 so as to enable the operator to discharge the liquid from the reservoir 61 into the vat 60, as required. It will be understood that whenever the operator opens the valve 63 he will close the valve 64 in the liquid passage 21.

The cloth-rest 12 is generally made in the form of a solid bronze or brass casting, which is quite expensive; but it may be made, as shown in Figs. 11 and 12, of strips of sheet metal, brass, aluminium or copper attached to the top of the vacuum chamber 11.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a machine for extracting liquid from cloth, in combination, the slotted cloth holder, means for regulating the operative length of said slot, a vacuum chamber, an air exhaust port and a separate liquid exhaust port below the same in said chamber.

2. In a machine for extracting liquid from cloth, in combination, a slotted cloth holder, a vacuum chamber beneath the same, removable plates at the end of said chamber, an inclined bottom to said chamber, a liquid exhaust about the lower end of said incline and an elevated air exhaust port.

3. In a machine for extracting liquid from cloth, in combination, a cloth holder containing an exhaust passage and a cover overlying the same consisting of a sheet of material pressed upon the cloth by atmospheric pressure.

4. In a machine for extracting liquid from cloth, in combination, a cloth holder, an exhaust passage through the same, a flexible cover for said passage and means whereby the same is held free to be pressed by atmospheric pressure against the cloth.

5. In a machine for extracting liquid from cloth, in combination, a cloth support provided with an exhaust passage, a cover free to atmospheric pressure, a carrier for said cover, means whereby said carrier and the cloth are operated to move the cloth and cover at a related speed.

6. In a machine for extracting liquid from cloth, in combination, a cloth support provided with an exhaust passage, a flexible sheet covering said passage and a carrier whereby said sheet is held at one edge.

7. In a machine for extracting liquid from cloth, in combination, a cloth support provided with an exhaust passage, a rotating carrier and a series of sheets carried thereby successively into position for covering said passage.

8. In a machine for extracting liquid from cloth, in combination, a cloth support provided with an exhaust passage, a flexible cover pressed toward said passage by atmospheric pressure and separate exhaust passages for air and liquid.

9. In a machine for extracting liquid from

cloth, in combination, a cloth holder provided with an exhaust passage and a cover conforming to the surface of said cloth holder adjacent to said passage.

10. In a machine for extracting liquid from cloth, in combination, a cloth support containing an exhaust passage, a traveling apron interposed between the cloth and said support and a cover overlying said exhaust passage.

11. In a machine for extracting liquid from cloth, in combination, a cloth support containing an exhaust passage, a traveling apron interposed between the cloth and said support and a traveling cover overlying said exhaust passage.

12. In a machine for extracting liquid from cloth, in combination, a cloth support provided with an exhaust passage, an air exhaust, a liquid exhaust, an apron interposed between the cloth and the support and a cover through which atmospheric pressure is transmitted upon the cloth.

13. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid and air, having separate passages for the air and liquid and screening whereby the flocks are retained in said vacuum chamber.

14. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid and air, an air exhaust a screen whereby the flocks are prevented from passing from said vacuum chamber into said air exhaust.

15. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid and air, having separate outlets therefrom for the air and liquid and an opening for the removal of flocks.

16. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid and air, having separate outlets therefrom for the liquid and air and a screen whereby the flocks are separated from the liquid.

17. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber, an air exhaust and a sealed liquid discharge.

18. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, an air exhaust, a separate liquid discharge and a mechanically driven valve controlling said discharge.

19. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of liquid and air, having separate outlets therefrom for the air and the liquid and a mechanically driven valve for controlling said liquid outlet.

20. In a machine for extracting liquid from cloth in combination, a cloth holder having an air passage, an air exhaust connected with said passage, a feeding mechanism whereby the cloth is fed over said cloth holder, a liquid discharge connected with said air exhaust passage, a mechanically driven valve controlling said liquid discharge and mechanism whereby both said feeding mechanism and said valve are driven.

21. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid and air, having separate outlets therefrom for the air and liquid, a mechanically driven valve in said liquid outlet and a screen whereby said valve is protected from flocks.

22. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid, air and flocks, and having separate outlets therefrom for said liquid, air and flocks, respectively.

23. In a machine for extracting liquid from cloth, in combination, a cloth holder adapted for the passage of air to and through the cloth, a vacuum chamber adapted to permit the separation of the liquid and air, an air-exhaust apparatus and an automatically operated valve controlling said liquid outlet.

24. In a machine for extracting liquid from cloth, in combination, a cloth holder containing an exhaust passage, a cover overlying the same, means whereby the cloth is fed and means whereby said cover is moved in unison with the cloth and for a substantial distance in the same direction therewith.

25. In a machine for extracting liquid from cloth, in combination, a cloth holder containing a slot extending transversely across the cloth, means whereby the length of said slot may be adjusted, an air-exhaust and a separate liquid exhaust.

26. In a machine for extracting liquid from cloth, in combination, a cloth holder, a cover free to atmospheric pressure, a vacuum chamber adapted to permit the separation of the liquid and air and having separate outlets therefrom for the air and liquid.

27. In a machine for extracting liquid from cloth, in combination, a vacuum chamber

and connected therewith a cloth holding mouth and separate air-exhaust and liquid-exhaust passages.

28. In a machine for extracting liquid from cloth, in combination, a cloth holder provided with an air passage, an air-exhaust connected with said passage, a separate liquid exhaust connected with said passage and mechanism whereby said liquid-exhaust is intermittently opened.

29. In a machine for extracting liquid from cloth, in combination, a cloth holder, having an exhaust passage through the same, a flexible cover for said passage and a holder removed from said exhaust passage to which said flexible cover is secured.

30. In a machine for extracting liquid from cloth, in combination, a cloth holder, having an exhaust passage through the same, a flexible cover for said passage and a holder removed from said exhaust passage to which said flexible cover is secured and means whereby said flexible cover holder may be moved away from said cloth holder to permit the insertion of the cloth.

31. In a machine for extracting liquid from cloth, in combination, a cloth holder, having an exhaust passage through the same, a cover of fibrous material for said passage and a holder removed from said exhaust to which said flexible cover is secured.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

ERNST GESSNER.

Witnesses:
WILLIAM JOHN WATSON,
FREDERICK J. DIETZMAN.