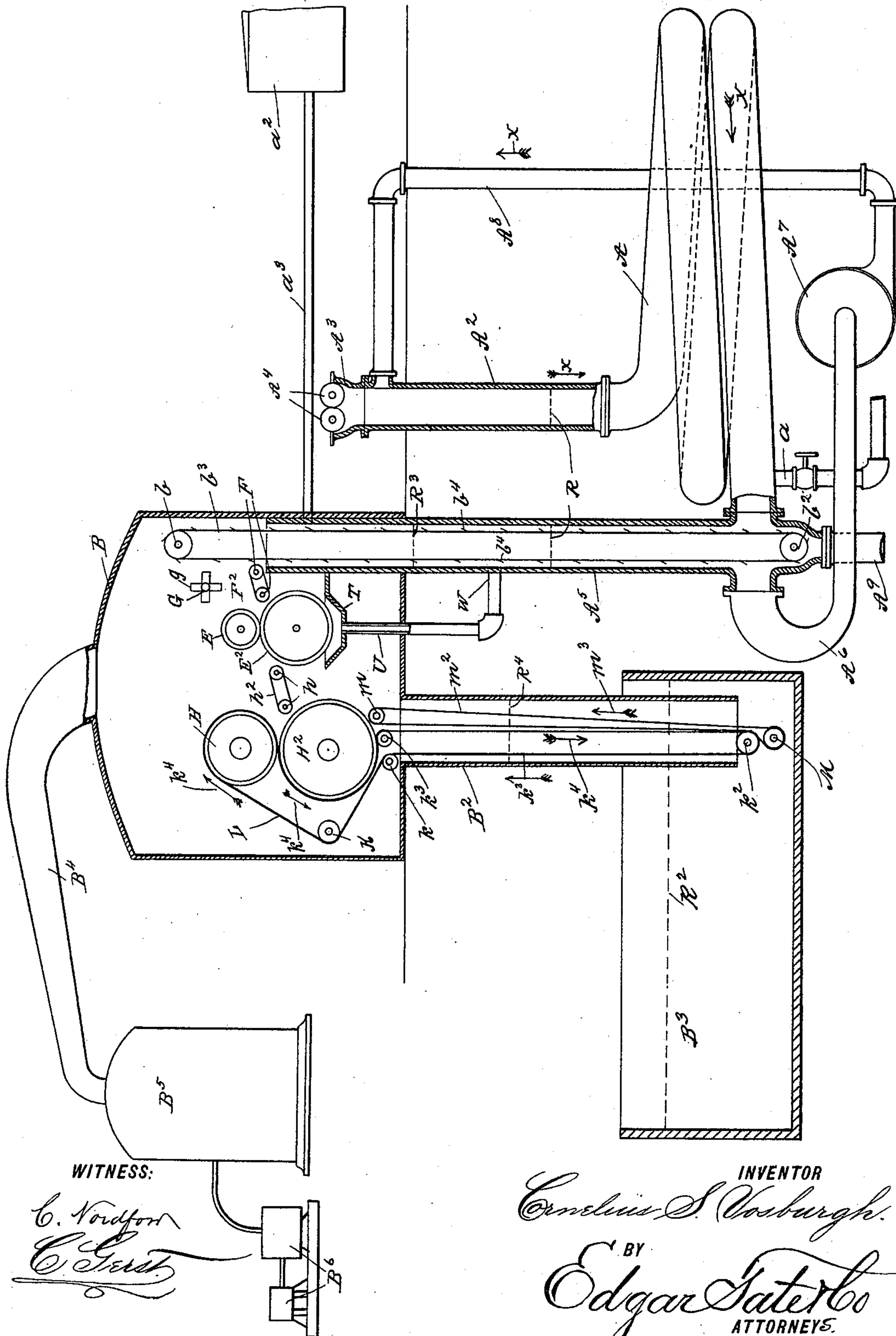


(No Model.)

C. S. VOSBURGH.
APPARATUS FOR EXTRACTING OIL.

No. 587,410.

Patented Aug. 3, 1897.



UNITED STATES PATENT OFFICE.

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APPARATUS FOR EXTRACTING OIL.

SPECIFICATION forming part of Letters Patent No. 587,410, dated August 3, 1897.

Application filed April 3, 1896. Serial No. 586,016. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS S. VOSBURGH, a citizen of the United States, and a resident of Union City, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Extracting Grease, &c., from Wool, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to apparatus for extracting the grease, oil, and fat from wool; and the object of this invention is to provide improved machinery of this character by means of which a continuous circulation of the wool in the solvent is secured, from which it is passed through pressure-rollers and through heated rollers in a vacuum, and also the vaporized solvent is conveyed to a condenser, where the same is condensed and re-used with but a minimum loss of the solvent; and with these and other objects in view the invention consists in the construction, combination, and arrangement of the parts hereinafter more fully described, and illustrated in the accompanying drawing, the same being a partial central vertical longitudinal section of the apparatus which I employ.

In the practice of my invention I provide a coil A, consisting of one or more coils of large pipe, to one end of which is connected a vertical stand-pipe A² and at the top of which is secured a head A³, across which are mounted two parallel rollers A⁴, upon which the wool is fed, and with the bottom or opposite end of the coil A connection is made with a vertical pipe A⁵, which extends below the bottom of the coil A and with the opposite side of which is connected a pipe A⁶, which communicates with a pump-casing A⁷, which casing is in connection by means of the pipe A⁸ with the upper end of the stand-pipe A², whereby a continuous connection is formed through the stand-pipe A², the coil A, the bottom of the pipe A⁵, thence into the pipe A⁶, through the casing A⁷ and pipe A⁸ back to the upper end of the stand-pipe A², and it is through these pipes that the solvent is circulated by means of the pump within

the casing A⁷, and as the wool passes between the rollers A⁴ the discharging solvent enters the stand-pipe through the pipe A⁸ and carries the wool downwardly into and through the coil A, as indicated by the arrow, upon the lower coil of said coil A.

The upper part of the vertical pipe A⁵ projects into a closed casing or chamber B, and mounted in said casing above the upper end of the pipe A⁵ is a shaft or roller *b*, and at the lower end of said pipe is a similar roller *b*², and mounted upon said rollers *b* and *b*² is a belt *b*³, the body portion of which is composed of wire mesh or similar material which is provided with outwardly-directed teeth or projections *b*⁴, and it is against this belt that the wool submerged in the solvent is forced by the continuous circulation before referred to; but the main portion of the solvent passes through the mesh and into the pipe A⁶, but the wool, being retained by the mesh, engages the projections thereof and is carried upwardly through the pipe A⁵ into the chamber B, and it will be observed that the dotted lines R in the stand-pipe A² and the vertical pipe A⁵ indicate the level at which the solution in said pipes will stand. The lower side of the vacuum chamber or casing B is also provided with a downwardly-directed tube B², the lower end of which opens into a tank or receptacle B³, adapted to receive water and into which the wool is discharged from the vacuum chamber or receptacle B, and communicating with the top of the chamber or casing B is a pipe B⁴, the outer end of which is in communication with a condenser B⁵, with which is connected a vacuum-pump B⁶.

In front of and a little below the upper end of the vertical pipe A⁵ and within the vacuum-chamber B are two pressure-rollers E and E², the lower rollers E being preferably of greater diameter than the upper roller, and between the rollers E and E² and the upper portion of the elevator-belt *b*³ are two rollers F, in which is mounted a belt F², and between the upper roller E and the roller *b* is a shaft G, provided with side plates or wings *g*, adapted to aid or accentuate the discharge of the wool from the belt *b*³ upon the belt F², from which the wool is conveyed to the pressure-rollers E and E².

In front of the rollers E and E² are two hollow rollers H and H², through which a current of hot water or steam is in continuous circulation from a suitable source of supply and which heats said rollers so that when the wool is received from the pressure-rollers E and E² by means of the belt h², carried by the rollers h, the remaining solvent retaining the wool is vaporized by the heat from the rollers H and H² without injury to the fiber of the wool, which is occasioned by bringing the wool in direct contact with heated water or steam, as is well known to those who have made practical experiments of this character.

Outside of the roller H² and adjacent to the side of the box or casing B is a shaft or roller K, and just below the bottom of the roller H² is a corresponding shaft or roll k, and below the bottom of the tube or casing B² is a similar shaft or roller k³, and another similar shaft or roller k³ is mounted just below the roll H² in the box or casing B, and mounted on the shafts or rollers K, k², and k³ and on the heat-rollers H and H² is a belt L, which is composed of wire or similar material, and said belt L is passed around said heat-rolls and said shafts or rollers in the direction of the arrows k⁴.

Arranged below the shaft or roller k² and adjacent to the bottom of the tank or receptacle B³ is a similar shaft or roller M, and at the right of and below the heat-roll H² is a similar shaft or roller m, and a belt m², similar to the belt L, is mounted upon the shafts or rollers M and m and moves in the direction of the arrows m³.

Arranged below the shaft or roller E² is a cup-shaped receptacle T, with the bottom of which communicates a pipe U, which is in communication with the vertical pipe A⁵ to convey the solvent which is pressed from the wool by the pressure-rollers E and E² back to the vertical pipe A⁵.

By means of the vacuum in the casing or chamber B the water in the discharge-pipe B² will be drawn upwardly therein to a point therein indicated by dotted lines referred to by the reference-letter R⁴, and it will be also observed that the solvent in the pipe A⁵ and the water in the discharge-pipe B² will seal this vacuum-chamber B and it will be impossible for the solvent to escape therefrom and commingle with the air, and by this means the volatilized solvent can be drawn through the pipe B⁴ into the condenser B⁵ by means of the vacuum-pump B⁶ and condensed with a minimum loss of the solvent.

I also provide a suitable receptacle or other device a², adapted to be used as a solvent-supply, and this receptacle is in communication with the upper part of the vertical pipe A⁵ by means of a pipe a³, so that the fresh solvent is maintained in the upper end of the vertical pipe A⁵. Thus the wool will be passed through a diluted solvent in the coil A to remove the greater portion of the grease and

other matter therefrom, and during its elevation by the belt b³ it will be passed through the pure or fresh solvent in the upper end of the vertical pipe A⁵ before the wool reaches the pressure-rollers E and E².

Heretofore it has been necessary to provide separate receptacles containing different grades of solvent, the first receptacle containing a solvent greatly diluted by the matter extracted from the wool during the first step of cleansing the wool and the second containing a purer solvent which removes more grease and other matter from the wool, and so on, while applicant passes the wool through two grades of solvent in substantially the same vessel and by means of the same mechanism.

The operation of the apparatus will be readily understood from the foregoing description when taken in connection with the accompanying drawing and the following description thereof: As before stated, the wool is received by the rollers A⁴, from whence it is discharged into the upper portion of the stand-pipe A² and is carried downwardly therein by the solvent discharged from the pipe A⁸, the solvent being forced upwardly into said pipe A⁸ by means of the pump within the casing A⁷, and the wool, being thus soaked with the solvent, will gradually circulate through the coil A, as indicated by the arrows x, and be discharged against the lower portion of the belt b³, the solvent passing through the meshes of the belt into the pipe A⁶ and the wool lodging thereon and being carried upwardly through the pure or fresh solvent at the top of the vertical pipe A⁵ over the rollers b in the vacuum chamber or casing B and being discharged upon the belt F², carried by the rollers F, from which the wool soaked with the solvent is passed through or between rollers E and E², thence upon the belt h², which carries it to the heated rollers H and H², thence upon the belt L around the roller H², exposing the wool, which is received in a thin layer, to one-half the heating-surface of said roller, and from this roller the wool is discharged into the tank B³, containing the water, and all of the solvent extracted from the wool by the pressure-rollers is collected by the receptacle T and conveyed to the vertical pipe A⁵ and reused, as before described.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described apparatus for extracting grease, fat and oil from wool, which consists of a coil through which a solvent is circulated, a stand-pipe or casing connected therewith, an elevator mounted in said stand-pipe or casing, pressure-rolls adjacent to the top of said elevator between which the wool is passed and incased heat-rolls adjacent to said pressure-rolls between which it is also passed, substantially as shown and described.

2. The herein-described apparatus for extracting grease, fat and oil from wool, which

consists of a coil through which a solvent is circulated, a stand-pipe or casing connected therewith, an elevator mounted in said stand-pipe or casing, pressure-rolls adjacent to the top of said elevator between which the wool is passed and incased heat-rolls adjacent to said pressure-rolls between which it is also passed, and belts or bands one of which is mounted on said heat-rolls for conveying the wool therefrom into a water-tank, substantially as shown and described.

3. The herein-described apparatus for extracting grease, oil or fat from wool and other substances which consists of a suitable coil or receptacle in which a solvent is placed, a stand-pipe or casing communicating therewith, and suitable pressure and incased heat rolls between which the wool is passed and means for conveying said wool through said coil or receptacle, through said stand-pipe or casing and through said rolls, substantially as shown and described.

4. The herein-described apparatus for extracting grease, oil, or fat from wool and other substances which consists of a suitable coil or receptacle in which a solvent is placed, a stand-pipe or casing communicating therewith, and suitable pressure and incased heat rolls between which the wool is passed and means for conveying said wool through said coil or receptacle, through said stand-pipe or casing and through said rolls, said rolls being located in a vacuum-chamber, substantially as shown and described.

5. The herein-described apparatus for extracting oil, grease and fat from wool, which comprises a suitable coil or other receptacle, a stand-pipe or casing communicating therewith, a pipe which communicates with the

bottom of said stand-pipe or casing and with the top of the coil or receptacle, and which is provided with a force-pump, a closed box or casing in which the stand-pipe or casing terminates, an elevator for conveying the wool upwardly through said pipe or casing, pressure-rolls mounted within said box or casing adjacent to the elevator and means for conveying the wool therethrough, and heat-rolls adjacent to said pressure-rolls and means for conveying the wool therethrough, substantially as shown and described.

6. The herein-described apparatus for separating grease, oil and fat from wool which comprises a suitable coil or other receptacle, a stand-pipe or casing communicating therewith, a pipe which communicates with the bottom of said stand-pipe or casing, and with the top of the coil or receptacle, and which is provided with a force-pump, a closed box or casing in which the stand-pipe or casing terminates, an elevator for conveying the wool upwardly through said pipe or casing, pressure-rolls mounted within said box or casing adjacent to the elevator and means for conveying the wool therethrough, and heat-rolls adjacent to said pressure-rolls and means for conveying the wool therethrough, and means for conveying the wool from said heat-rolls into a water tank or receptacle, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 28th day of March, 1896.

CORNELIUS S. VOSBURGH.

Witnesses:

C. GERST,

A. C. McLOUGHLIN.