

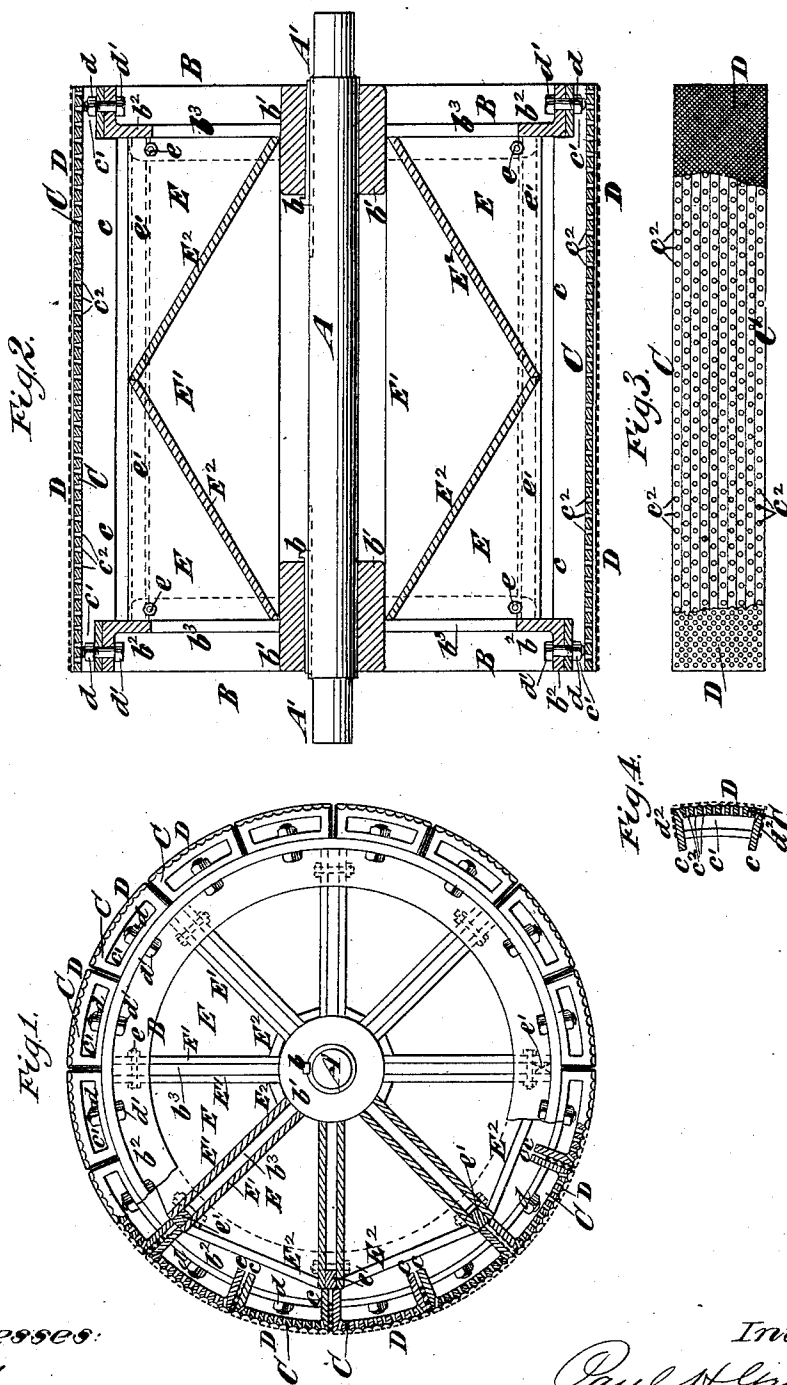
(No Model.)

P. H. GRIMM.

CYLINDER FOR SEPARATING LIQUIDS FROM SOLIDS BY PRESSURE.

No. 358,974.

Patented Mar. 8, 1887.



Witnesses:

Olundgren
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Inventor:

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by his attys
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UNITED STATES PATENT OFFICE.

PAUL H. GRIMM, OF GLEN COVE, NEW YORK, ASSIGNOR TO THE GLEN COVE
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CYLINDER FOR SEPARATING LIQUIDS FROM SOLIDS BY PRESSURE.

SPECIFICATION forming part of Letters Patent No. 358,974, dated March 8, 1887.

Application filed November 1, 1886. Serial No. 217,760. (No model.)

To all whom it may concern:

Be it known that I, PAUL H. GRIMM, of Glen Cove, in the county of Queens and State of New York, have invented a new and useful
5 Improvement in Cylinders for Separating Liquids from Solids by Pressure, of which the following is a specification.

In my United States Letters Patent No. 296,000, dated April 1, 1884, there is shown
10 and described a machine for separating the solid and liquid portions of starch refuse, which comprises pairs of rollers between which the coarse refuse, saturated with water, passes, and by the action of which a large percentage
15 of the water is expressed from the coarse refuse. In such a machine one roller has a plain rubber-covered or other suitably-constructed surface, while the other or bottom roller has its surface so constructed as to afford a free
20 avenue of escape for water which is pressed out of the refuse. In that machine the lower roller was provided with channels or gutters upon its periphery, and had a covering of wire-cloth or other foraminous material, which per-
25 mitted the free passage of water through it into the gutters or channels, whereby the water was conducted to the ends of the roll. Where the wire-cloth or other covering is continuous throughout the periphery of such cyl-
30 nder or roll, any rupture of the cloth at one point is with difficulty repaired without renewing the entire covering.

The objects of my invention are to provide
35 a cylinder for the purpose above described, in which ready provision is afforded for renewing any portion of the cylinder which may be broken, and also for renewing any portion of the foraminous covering which may become ruptured or otherwise injured.

40 Although the cylinder which forms the subject of my present invention is intended more particularly for separating water from the coarse refuse of starch and glucose manufacture, it may be used in other manufactures
45 for separating liquids from solids by pressure; and it will be understood that the cylinder which forms the subject of my present invention is to be employed in connection with a companion cylinder or roll, as described in my
50 aforesaid patent.

According to my present invention I con-

struct the cylinder of two heads or end frames, and perforated staves extending lengthwise of the cylinder and secured to the heads or end frames, and having their outer surfaces arc-
55 shaped in transverse section; and I make the foraminous covering of wire-cloth, perforated metal, or other analogous material, which is applied to the outer surfaces of the staves, and forms the exterior surface of the cylinder in
60 sections which correspond to the staves of the cylinder. By this construction I provide for readily renewing any stave of the cylinder or any one of the sections of covering. The cov-
65 ering may be advantageously secured by cutting it slightly wider than the staves and then folding or turning the longitudinal edges of the covering-sections inward upon the edges of the staves, so that the edge portions of the cov-
70 ering-sections will be secured between the staves. In order to afford a free avenue of escape for the water which may pass through the covering, I flute or channel the staves lengthwise, or otherwise construct them with irregular ex-
75 terior surfaces, and the staves may have on opposite longitudinal edges inwardly-extending flanges for strengthening them, and they may have at their ends pockets adapted to receive the nuts for bolts which pass through the rims of the heads and serve to secure the
80 staves thereto.

In order to provide for the ready escape from the cylinder of water or other liquid which pours through the perforated periph-
85 ery, I construct, by means of suitable boards or plates, conductors, which receive the water passing through the periphery of the cylinder and deliver it at the ends of the cylinder. These conductors I form by side boards or
90 plates, which are secured to the opposite sides of the radial arms in the two heads, and which extend lengthwise of the cylinder, and the bot-
95 toms of these conductors are formed by boards which extend between the two side boards or plates secured to adjacent arms. These bot-
tom boards are preferably of wedge shape, and are inclined from about the middle of the length of the cylinder in opposite directions relatively to the axis of the cylinder.

The invention will be hereinafter more fully
described, and pointed out in the claims.

In Figure 1 of the accompanying drawings

I have represented in end view and transverse section a cylinder embodying my invention. Fig. 2 is a longitudinal section of the cylinder. Fig. 3 is a face view of one of the staves thereof, and Fig. 4 is a transverse section of one of the staves with its foraminous covering-section applied thereto.

Similar letters of reference designate corresponding parts in all the figures.

A designates the shaft, which at the ends may have journal portions A'; and B designates two heads or end frames, which may be of cast metal, and which are arranged at suitable distances apart upon the shaft A. These heads or end frames, B, may be secured firmly to the shaft by means of keys *b*, or otherwise. Each head comprises a hub or center, *b'*; a circular rim, *b''*, which may be L-shaped or angular in transverse section, as shown in Fig. 2, and radial arms *b'''*, connecting the hub and rim.

For a purpose hereinafter described the heads or end frames, B, should be secured upon the shaft in such relative positions that their arms *b'''* shall lie in the same planes. The periphery of the cylinder is composed of staves C, which are segmental in their transverse section, as best shown in Fig. 1, and which may be of cast metal. The staves may have at opposite longitudinal edges inwardly-extending ribs *c*, for giving them the desired strength, and at the outer ends they may be constructed with inward slots or pockets *c'*, to receive the nuts *d* of bolts *d'*, whereby said staves are secured to the rims *b''* of the heads B. The nuts *d* may be slipped inward from the ends of the staves and the bolts inserted outward through the rims *b''* and turned into the nuts, which may be held by a suitable wrench. In this way I provide for properly securing the staves C to the heads B, and at the same time leave the entire length of the stave uniform and unbroken upon its outer surface, so that the whole length of the stave will be effective for pressing. Throughout its surface each stave is formed with numerous small holes or perforations *c''*. These holes or perforations may be formed in the staves by casting or drilling, and they may be, for example, about one quarter ($\frac{1}{4}$) of an inch in diameter at the outer surface of the stave, and they may flare inward and be of considerably larger diameter at the inner surface of the stave. This taper form of the perforations *c''* greatly facilitates casting them properly, and it also prevents their clogging by any material which may pass through the foraminous covering and enter their outer ends.

The cylinder has a covering, D, which is not continuous throughout the periphery thereof, but is made in sections corresponding to the staves C, each stave having a separate section of foraminous covering. This covering D may consist of wire-cloth, as shown at the right-hand portion of Fig. 3, or of very finely perforated sheet metal, as shown at the left-

hand portion of Fig. 3; or it may consist of any finely-perforated, reticulated, or foraminous material suitable for the purpose.

The covering-sections D may be cut somewhat wider than the staves C, and the longitudinal edge portions of the covering-sections D may be lapped or folded inward upon the sides of the staves, as shown at *d''* in Fig. 4. The turned-in edges of the covering-sections D will then be secured between the staves and the covering-sections will not need other means to hold them in place. The particles of solid matter will in the first use of the cylinder wedge in between the staves C so as to entirely fill the cracks or crevices between the staves, and therefore will not only prevent the passage of further solid matter through these crevices, but will also aid in holding the covering-sections tightly upon the staves.

To facilitate the escape of water or other liquid which passes through the covering D, the outer surfaces of the staves should be of irregular construction, and, as shown, the staves are fluted, grooved, or channeled on their outer surfaces from end to end.

When any portion of the covering D becomes ruptured, or when any stave becomes broken by the passage through the machine of stones or fragments of iron, it is only necessary to renew such covering-section D or such stave in order to make the cylinder perfect.

To provide for the ready escape from the interior of the cylinder of water which may pass through its periphery, I form in the cylinder, and between adjacent arms, conductors E, which deliver the water or other liquid to the opposite ends of the cylinder. As here represented, the arms *b'''* are flat at the sides, and E' designates side boards or plates, which are placed against the flat sides of the arms, as shown in Fig. 1, and which extend from end to end of the cylinder, or rather from the inner side of the rim *b''* of one head to the inner side of the rim of the other head. These boards or plates may be secured in place by means of bolts *e*, inserted through them, and the arms *b'''*, as shown in Figs. 1 and 2.

E² designates bottom boards or plates, which close the spaces between the side boards or plates, E', and which are here shown as inclined from about the middle of the length of the cylinder in opposite directions, toward and relatively to the axis of the cylinder. At their inner ends the bottom boards, E², are near the outer edges of the side boards, E', and from their point of meeting they pitch or incline in opposite directions toward the ends of the cylinder, so that liquid drained into the cylinder through the periphery will flow readily toward the ends and be delivered from the cylinder without crossing the diameter.

In order to close the spaces between the boards or plates E', which are applied to the opposite sides of each arm *b'''*, I may lay and secure between them a strip of wood, *e'*, as best shown in Fig. 1, so that water cannot pour

downward between the two parallel boards E', which are applied to each arm.

It will be obvious that the arms b^3 in the two heads B should lie in the same planes, so that the straight boards or plates E' may lie against their opposite sides.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A cylinder for separating liquids from solids by pressure, composed of heads or end frames, perforated staves extending lengthwise of the cylinder and secured to the heads or end frames, and having their outer surfaces arc-shaped in transverse section, and a foraminous covering applied to the outer surfaces of the staves to form the exterior surface of the cylinder, and made in sections corresponding to the staves, substantially as herein described.

2. A cylinder for separating liquids from solids by pressure, composed of heads or end frames, perforated staves secured thereto and extending lengthwise of the cylinder, and having grooved or irregular outer surfaces which are arc-shaped in their transverse section, and a foraminous covering applied to the outer surfaces of the staves to form the exterior surface of the cylinder, and made in sections corresponding to the staves, substantially as herein described.

3. A cylinder for separating liquids from solids by pressure, consisting of heads or end frames, perforated staves secured thereto, and a foraminous covering applied outside the staves and made in sections corresponding to the staves, the opposite edges of the covering-sections being turned inward over the edges of the staves and secured between the staves, substantially as herein described.

4. The combination, with a pressing-cylinder having a perforated periphery and heads consisting each of a hub or center, a rim, and radial arms, of conductors for liquid passing through the periphery of the cylinder, consisting of side boards or plates secured at the sides of the arms and extending lengthwise of the cylinder, and bottom boards or plates connecting the boards or plates which are applied to adjacent arms, substantially as herein described.

5. The combination, with a pressing-cylinder having a perforated periphery and heads consisting each of a hub, a rim, and radial arms, of conductors for liquid which may enter the cylinder through its periphery, consisting of side boards or plates, E', applied to the sides of the arms and extending lengthwise of the cylinder, and bottom boards or plates, E², extending between the boards or plates E' and inclined from the middle of the length of the cylinder in opposite directions relatively to the axis, substantially as herein described.

6. The combination, with the circular heads B, of the perforated staves C, having longitudinal strengthening flanges at opposite longitudinal edges, and having pockets or slots c' at their ends for the reception of nuts to the bolts which secure the staves in place, and a foraminous covering applied to the staves and made in sections corresponding to the staves, substantially as herein described.

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Witnesses:

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