June 4, 1929. H. R. WILLIAMS 1,715,398

SUCTION BOX

Filed March 19, 1927

Fig. 1.

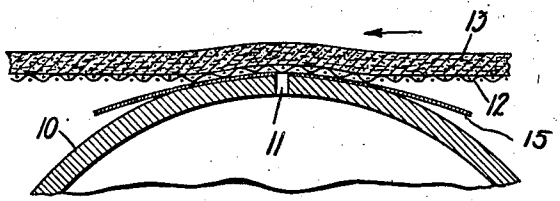
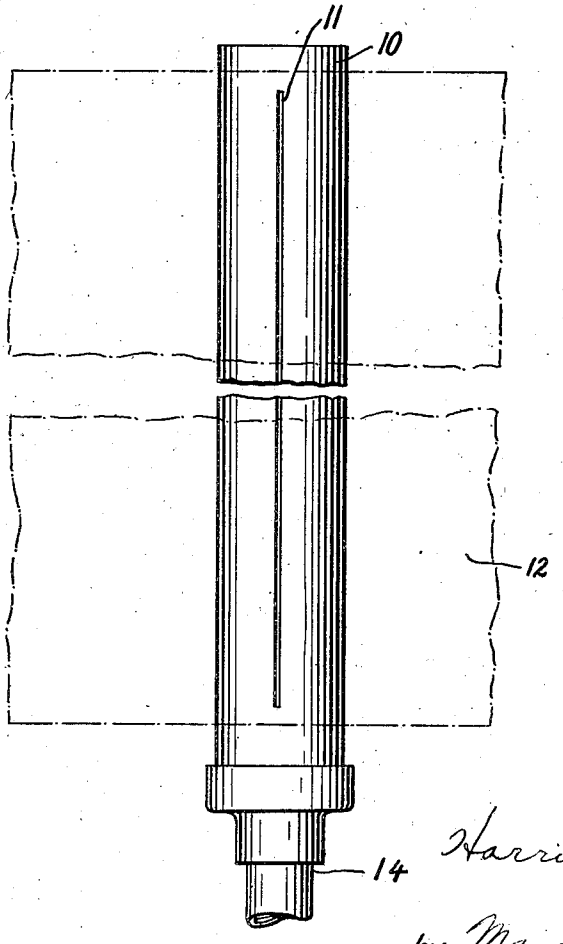


Fig. 2.



Inventor
Harrison R. Williams
by Marcus and Norris
Atty's

Patented June 4, 1929. 1,715,398

UNITED STATES PATENT OFFICE.

HARRISON R. WILLIAMS, OF NEW YORK, N. Y.

SUCTION BOX.

Application filed March 19, 1927. Serial No. 176,675.

My present invention relates to a suction box for use in web making machines and the like. While capable of other applications, it is of particular utility in a machine designed to form a web of pulped material having great lightness. Heretofore it has been customary to employ the ordinary Fourdrinier or paper making machines for this purpose. Such machines while well enough adapted for the manufacture of paper, have produced webs which are too dense for certain desired purposes, the chief reason for this being the fact that in such machines, suction is applied to the wet web over a large area. In contradistinction to this, I employ a suction box having a single narrow opening extending across the formed web, such box being operated with a comparatively high suction. This high suction has the effect of withdrawing the air at high velocity and is effective to carry off a maximum amount of water. Furthermore, due to the comparatively narrow area subjected to suction at a given instant, a minimum of braking action on the travelling belt results.

In an organization of devices of which my improved suction box is adapted to form a part, the web which has thus been partially dried is fed to a chamber where it is more or less completely dried by circulating heated air thereover, it being a feature of the assembled devices and of the process carried out by them that no pressure rollers are used whereby compressing of the web or felt is avoided. By means of the type of suction box described just enough cohesion is imparted to the web to enable it to hang together.

In the drawing, Figure 1 shows in vertical section a portion of an illustrative embodiment of my invention while Figure 2 is a plan view on a reduced scale, of the device, the belt being indicated in dot-and-dash lines.

As shown, a suction box proper 10 preferably of circular cross section or at least of arcuate shape at the top has extending longitudinally thereof a comparatively narrow slit 11. Above the suction box 10 and in contact with the slit 11 is the ordinary belt or wire 12 bearing a mixture of pulped material and water 13 which has been flowed out thereupon and which belt has the usual movement of translation to convey the web to points where other operations are performed upon it. After considerable experimentation, I have arrived at a width of slit of from $\frac{1}{16}$ to $\frac{1}{32}$ of an inch, a size which I believe to be novel in the art. Box 10 is connected to a source of suction (not shown) through a pipe 14, which has a cross section at least as larger as the suction area. By virtue of this construction a high vacuum is applied across a narrow strip of the pulp, so that the air is withdrawn at a high velocity, thus carrying off the maximum amount of moisture and preventing the slit from becoming clogged by fibers or other particles which may enter it. As shown in Figure 1, due to the circular shape of the box 10, the wire 12 and web 13 lie over and conform to the shape of the box for an appreciable portion of its periphery on either side of slit 11 such overlying portions forming an effective seal therefor. Preferably, I interpose a shield 15 of say, hard brass having a cut-out portion accommodating slit 11 whereby to afford a proper bearing action of the wire 12 which in the usual case is of soft brass.

As above pointed out, I contemplate employing a fairly strong suction whereby to compensate for the comparatively small area of suction to which belt 12 is exposed. The material which my improved device is particularly designed to operate upon is digested wood pulp or mixtures containing same whereby to prepare the material for subsequent operations which will convert it into articles whose requisite qualities include great lightness and absorptiveness such as catamenial and surgical pads, wadding and the like.

What I claim is:

1. A suction box comprising a box member proper having a narrow slit of substantially from $\frac{1}{16}$ to $\frac{1}{32}$ of an inch extending longitudinally thereof, said box being adapted to extend across the belt of a web making machine.

2. In combination with the wire of a web making machine, a suction box lying transversely of said wire, said box having an arcuate surface contacting with the wire and a longitudinal, relatively narrow, suction applying slit intermediate said arcuate portion, the parts being arranged whereby the wire overlies said slit at either side thereof so as to form an effective seal therefor.

3. In combination with the wire of a web making machine, a suction box lying transversely of said wire, said box having an arcuate surface contacting with the wire and a longitudinal, relatively narrow, suction applying slit intermediate said arcuate portion, the parts being arranged whereby the wire

overlies said slit at either side theerof so as to form an effective seal therefor and an arcuate shaped sealing and shielding member between the suction box and the wire.

4. A suction box comprising a box member proper adapted to lie transversely of a web bearing wire, said member being of convex arcuate cross section at the portion adapted to contact with the wire and having a narrow longitudinal slit intermediate the arcuate portion.

5. A web-making machine, a wire on which the web is formed, a suction box lying transversely of said wire, and disposed adjacent the depositing end thereof, whereby said box acts to separate the water from the deposited pulp and to form a web therefrom, said box being of arcuate cross section at the portion adapted to contact with the wire and having a narrow longitudinal slit intermediate the arcuate portion.

In testimony whereof I have affixed my signature to this specification.

HARRISON R. WILLIAMS.