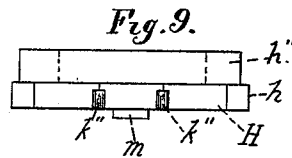
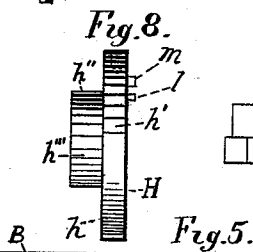
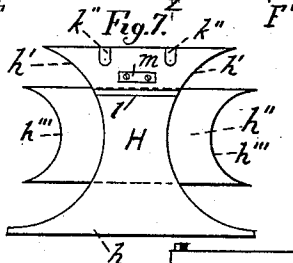
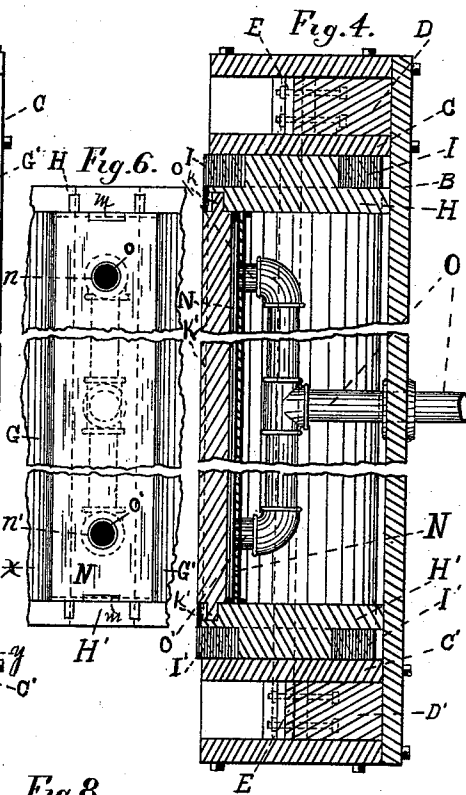
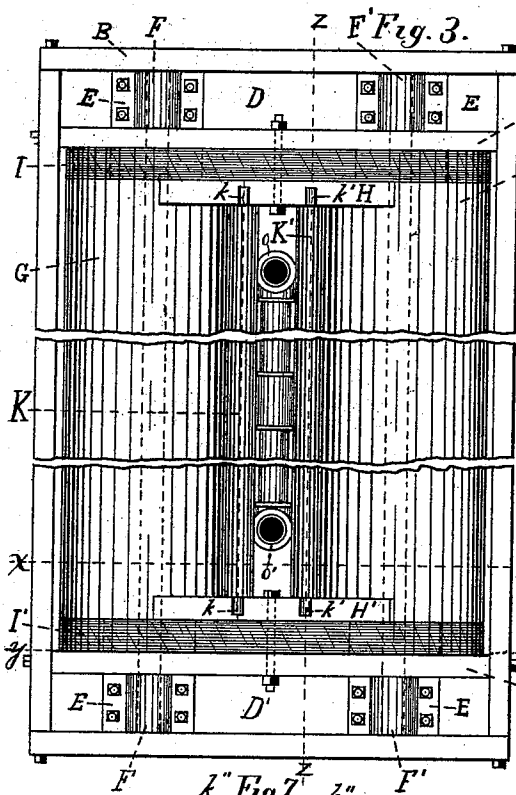
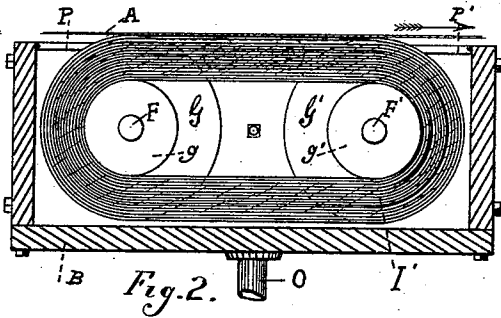
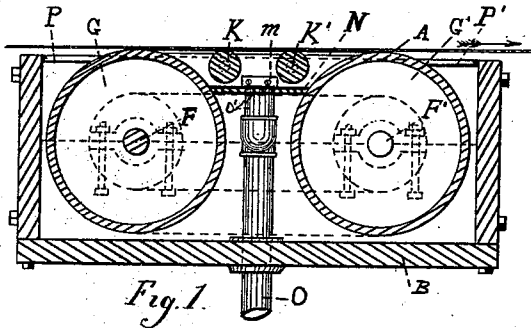


(No Model.)

E. SANDERSON.
SUCTION BOX FOR PAPER MACHINES.

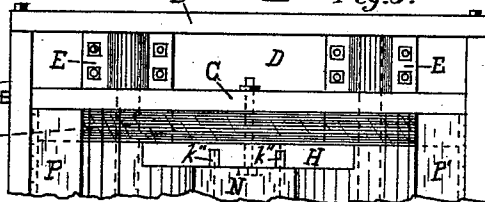
No. 528,261.

Patented Oct. 30, 1894.



WITNESSES.

W. M. Sawcett
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INVENTOR.
Ephraim Sanderson,
By
J. A. Osborne & Co.,
His Attorneys.

UNITED STATES PATENT OFFICE.

EPHRAIM SANDERSON, OF CLEVELAND, OHIO.

SUCTION-BOX FOR PAPER-MACHINES.

SPECIFICATION forming part of Letters Patent No. 528,261, dated October 30, 1894.

Application filed December 8, 1893. Serial No. 493,093. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIM SANDERSON, a subject of the Queen of Great Britain, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Suction-Boxes for Paper-Machines, of which the following, with the accompanying drawings, is a specification.

My invention relates to stationary suction boxes placed below the wire of a paper machine for the purpose of creating a vacuum that moisture will be extracted from the pulp as it is brought over the suction boxes by the travel of the wire.

The object of my invention is to improve such suction boxes to simplify their construction and to increase their durability and effectiveness. To this end, my invention consists in the details of construction and combination of parts illustrated in the drawings, described herein and defined in the claims.

In the drawings, Figure 1 is a section of one of my improved suction boxes longitudinally of the travel of the wire on the line $x x$ of Fig. 3. Fig. 2 is a sectional view on the line $y-y$ of Fig. 3, and illustrates the relation of the head block and rubber or flexible traveling heads with reference to each other and to said rolls. Fig. 3 is a plan of my improved suction box, the wire and the retaining leathers and plates being removed. Fig. 4 is a longitudinal section through one of my suction boxes at right angles to the line of travel of the wire, and is taken on the section $z z$ of Fig. 3. Fig. 5 is a fragmental plan of one end of my suction box with the retaining leathers and with the retaining plate in position. Fig. 6 is a fragmental section which illustrates the position of the retaining plate with reference to the head blocks and rolls. Fig. 7 is a side elevation of one of the head blocks. Fig. 8 is an end elevation of one of the head blocks, and Fig. 9 is a top view of the same.

My suction box is arranged for the formation of an air tight chamber below the mold or wire, of which suction chamber the pulp on the mold or wire with the dekle straps (not shown) constitute the top of the chamber. The mold or wire A and the dekle straps are of known construction and need no description.

My improved suction box is situated immediately below the line of travel of the mold or wire A, in contact with the under side thereof, as illustrated by Figs. 1 and 2, and as hereinafter described.

The rectangular box, B, of substantially the form illustrated, forms the inclosing case for my improved suction box. Inside of the ends of said rectangular box, B, are placed boards or partitions, C, C', which form the ends of the suction box proper. Between the partitions C and C' and the ends of the box B are placed blocks D and D' upon which are seated journal boxes E in which turn the axes F, F', and F', F', of the rollers G, G'. The axes F, F', and F', F', pass through bores (not shown) in the partitions C and C'. To the inside of the partitions C and C' are placed head blocks H and H' of the form illustrated by Figs. 7, 8 and 9. These blocks consist of an upright piece h having curved sides h' to fit against the periphery of the rolls G and G', and the cross piece h'' having the curved ends h''' to fit against the hubs g and g' of the rollers G and G'. The cross pieces h'' of the head blocks H are placed against the partitions C and C', and rubber or flexible heads I and I' encircle the hubs g and g' of the rollers G and G', and the cross piece h'' of the head blocks H and H', as illustrated. The rubber or flexible traveling heads fill in the space the full depth of the hubs g and g' of the rollers G and G', and fill up the entire space between the upright parts h of the head blocks H and H' and the partitions C and C'. The upright-pieces h of the head-blocks prevent the flexible traveling heads from being drawn inwardly on their upper lap, and the cross-pieces h'' prevent the flexible traveling heads from sagging on their upper lap.

The wire A with its dekles (not shown) form an air tight connection with the rubber or flexible traveling heads I and I', and said rubber or flexible traveling heads tightly close the ends of the vacuum chamber and prevent the passage of air and water there-through. The partitions, C, and C', being placed against the outer ends of the hubs g and g' of the rollers G, G', the rubber or flexible traveling heads I, I', fill the space between the ends of the rollers G, G' and said

partitions, as illustrated. Rollers, K, K', having axles *k, k'* are carried in journals *k''* in the upper face of the head blocks H and H'. The rollers, K, K', may be dispensed
5 with as well as the retaining plate herein-
after described, in which case the head
blocks H may be modified by dispensing with
the upright part *h*, using only the part *h''*.

On the inside of the head blocks H and H'
10 are fastened cleats *l* and blocks *m* between
which are placed the retaining plate N. The
retaining plate N has two openings *n, n'*,
through which projects the open ends *o, o'* of
the T-headed suction pipe O.

15 The suction pipe O enters through the bot-
tom of the rectangular box B, as illustrated,
and is connected in any suitable manner with
vacuum pumps. The open ends *o, o'* of the
T-headed suction pipe O should be as near
20 as practicable to the under side of the wire A
without coming in contact therewith.

To the top of the rectangular box B, along
each of its sides, are fastened retaining leath-
ers, P and P', which have their outer edges
25 fastened to the top edge of the rectangular
box B and their inner edge resting upon the
rollers G, G'. The wire A with the pulp there-
on rests upon the upper sides of the rollers
G and G', forming an air tight connection
30 therewith; and the rollers K and K' support
the wire between said rollers and prevent its
sagging. The ends of the vacuum chamber
are formed by the rubber or flexible travel-
ing heads I and I' and the head blocks H and
35 H', and the sides of the vacuum chamber are
formed by the rollers G and G', while the top
of the vacuum chamber is formed by the pulp
carried by the wire A. When a vacuum is
created beneath the wire A by means of vacu-
40 um pumps through the vacuum pipe O, the
air pressure forces the wire A with the pulp
thereon into intimate contact with the rub-
ber or flexible traveling heads I and I' and
the rollers G and G'.

45 The box B is preferably partly filled and
kept constantly supplied with water from any
convenient source, and the level of the water
in the rectangular box B will be maintained

at any suitable point in any well known man-
ner while the machine is in operation.

The object of the retaining leathers P and
P' is to prevent air pressure upon the water
below said plates from forcing the water up
between the rollers G and G' and being car-
ried away through the suction pipe O; and
55 the object of the retaining plate N is to resist
the tendency of water to rise to the openings
o, o' of the suction pipe O within the vacuum
chamber.

The rollers G, G' are represented in the 60
drawings as cylinders. They are so repre-
sented because being made of metal this con-
struction makes them lighter.

It will readily be understood that when
connection is opened with the vacuum pumps 65
a vacuum will be created in the air tight
chamber and that the water and moisture in
the pulp lying on the surface of the wire or
mold will be extracted as the wire passes
over the vacuum chamber.

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

1. The combination, in a suction box, of a
box, B; head blocks, H, H'; rollers G, G', hav-
ing hubs *g, g'*; flexible traveling heads en- 75
circling the hubs of said rollers and said head
blocks; retaining leathers, P, P': and a re-
taining plate, N, substantially as illustrated
and described.

2. The combination, in a suction box, of 80
rollers having hubs, flexible traveling heads
to travel over said hubs, and head-blocks in-
terposed between said rollers, the head-blocks
having upright-pieces *h* to prevent the flexi-
ble traveling heads from being drawn in- 85
wardly on their upper lap and cross-pieces *h''*
to prevent the flexible traveling heads from
sagging on their upper lap, substantially as
described.

In testimony whereof I affix my signature, in 90
the presence of two witnesses, this 18th day
of November, 1893.

EPHRAIM SANDERSON.

Witnesses:

J. A. OSBORNE,
E. E. OSBORNE.