

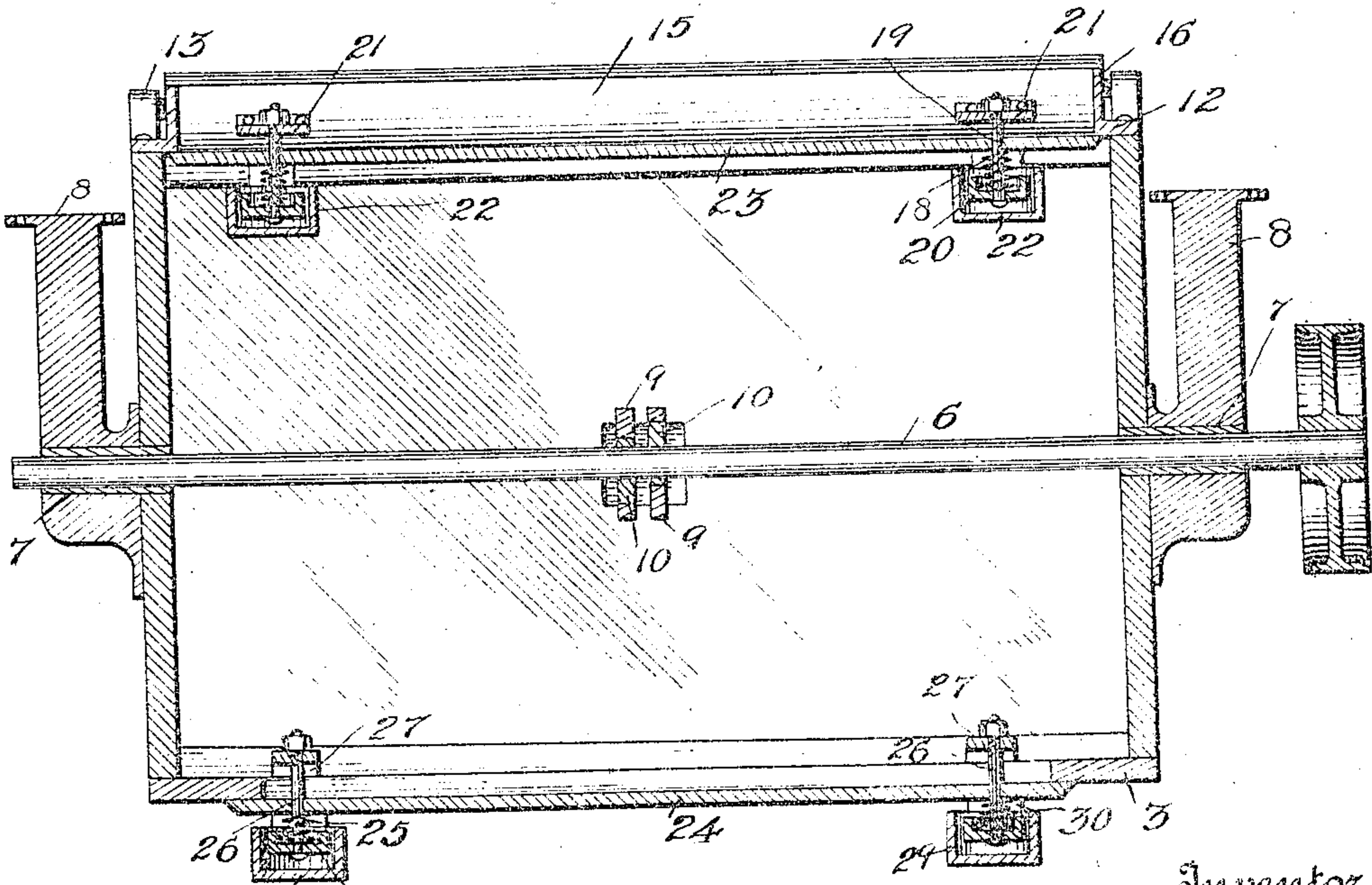
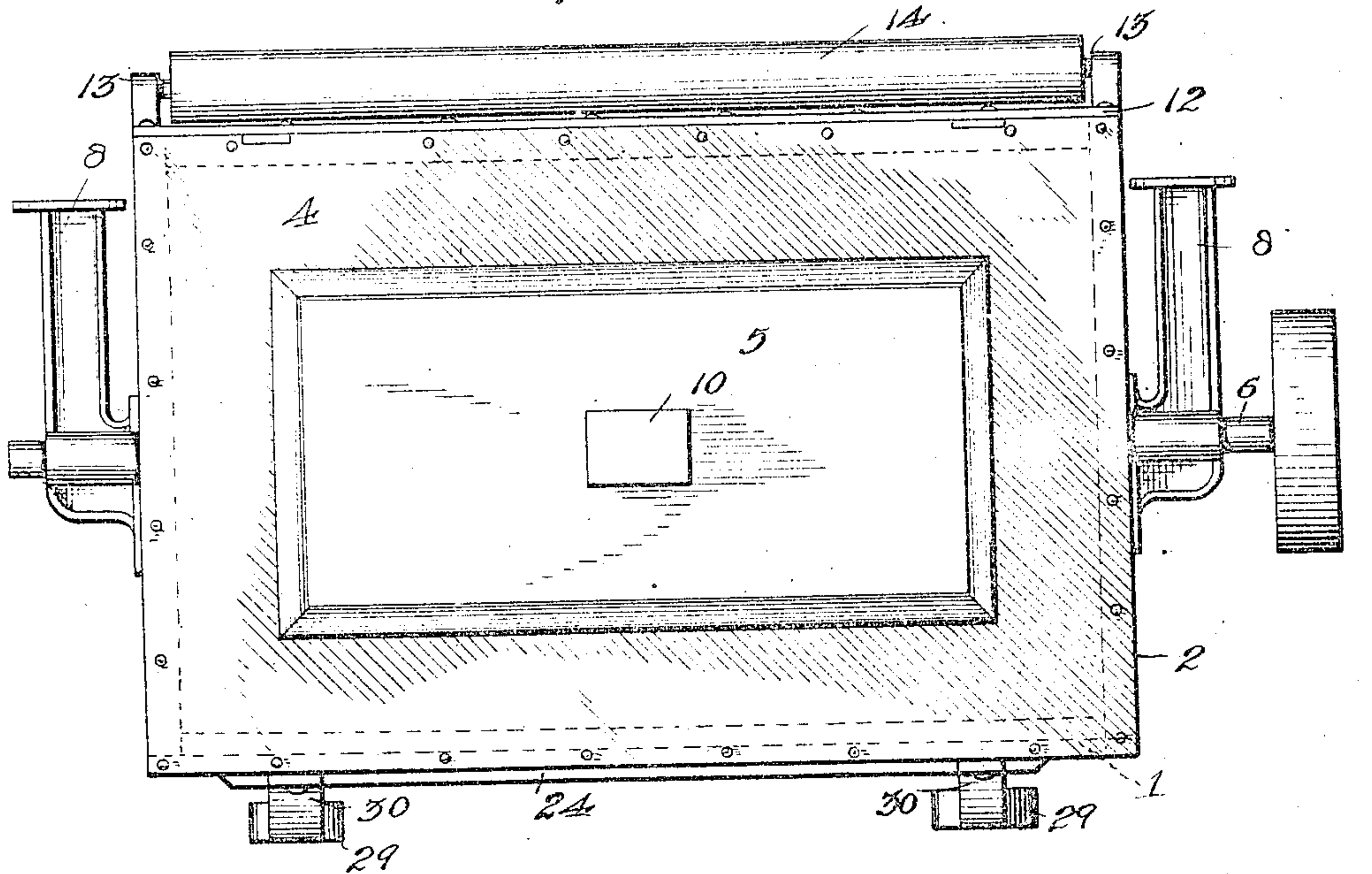
No. 859,167.

PATENTED JULY 2, 1907.

F. M. CHAPMAN.
ANTIFRICTION SUCTION BOX
APPLICATION FILED JAN. 26, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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V. E. Burner

Fig. 2.

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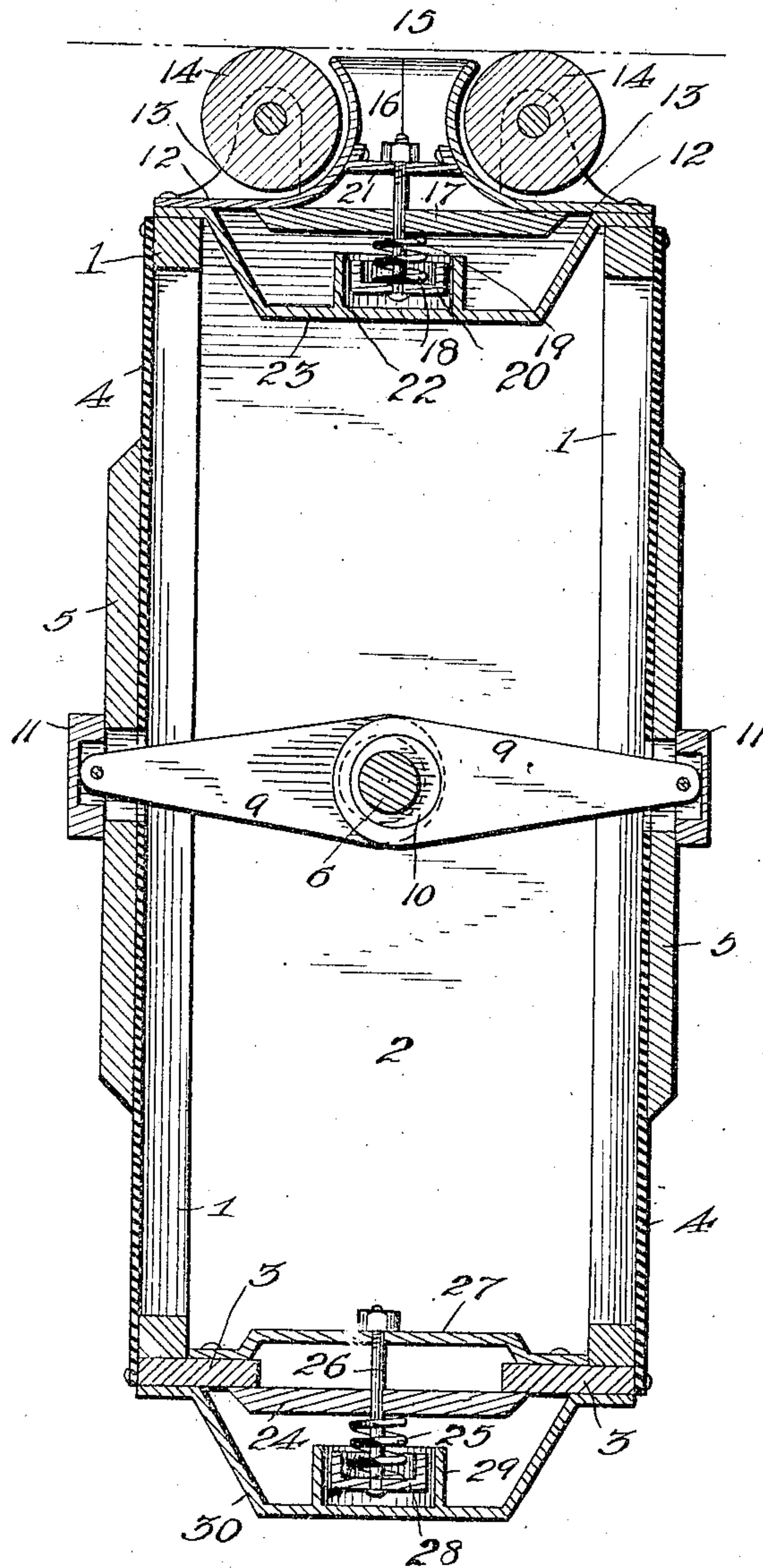


Fig. 3.

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UNITED STATES PATENT OFFICE.

FRANK MORSE CHAPMAN, OF FORT EDWARD, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO CHAPMAN FRICTIONLESS SUCTION-BOX COMPANY, OF GLENS FALLS, NEW YORK, A CORPORATION OF NEW YORK.

ANTIFRICTION SUCTION-BOX.

No. 859,167.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed January 26, 1907. Serial No. 354,346.

To all whom it may concern:

Be it known that I, FRANK MORSE CHAPMAN, a citizen of the United States, residing at Fort Edward, in the county of Washington and State of New York, have invented certain new and useful Improvements in Antifriction Suction-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to suction boxes used in connection with paper making machines. Heretofore the suction for boxes of this class has been derived from a pump which, by suitable pipe connections, is often used to operate a number of suction boxes. The suction thus derived in each box is not very great and, in order that it may do its work, the wire carrying the wet paper must be passed over the box in contact with the top thereof. The drawing of the wire across the top of the box in this way creates a great deal of friction and soon wears out the wire.

It is the object of the present invention to provide a suction box with greatly increased suction power whereby it may be successfully operated while the wire is supported upon antifriction rollers above and out of contact with the top thereof.

The invention consists in the features of construction and combinations of parts hereinafter described and specified in the claims.

In the accompanying drawings, illustrating the preferred embodiment of my invention: Figure 1 is a side elevation of the suction box. Fig. 2 is a central vertical longitudinal sectional view thereof, and Fig. 3 is a vertical cross-sectional view on an enlarged scale.

Referring more particularly to the drawings, the box is formed in part of side frames 1, end pieces 2 and a bottom piece 3, all preferably of wood. Over each of the side frames is fastened a sheet of rubber 4 to the central portion of which is secured a piece of wood 5. Through the center of the box runs a shaft 6 mounted in bearings 7 secured to the end pieces 2. Said bearings are preferably formed with upward extensions 8 adapted to be bolted to the paper machine whereby the box is held in place below the wire. Links 9 connect the sides of the box with eccentrics 10 mounted on said shaft. Each link passes through the rubber and wooden bracing piece 5 of one side and is pivoted in a block 11 on the outer surface of said piece 5. The eccentrics are so arranged that both sides will move out together and in together.

The top of the box is composed of two similar castings 12, one secured to the top strip of each of the side frames. Each of said castings is provided with sup-

porting bearings 13 for a roller 14. The inner edge of each casting is extended upwardly at 15 nearly to the level of the top of the rollers and is preferably curved to conform to the surface of one of said rollers. The ends of the opening between the upward extensions 15 of the castings, are closed by meeting flanges 16 on said castings. A valve plate 17 closes said opening at the bottom and is held up by coiled springs 18, preferably two in number, one near each end of said plate. Each spring is adjustable to take up wear, by means of a pin 19 passed through said spring, a cup 20 forming a bearing for said spring and also through a cross piece 21 bolted to the upward extensions of the roller-carrying castings. The cup 20 is guided within a cup 22 on another cross-piece 23 arranged below the valve plate.

The slot in the bottom 3 is closed from beneath by a valve plate 24 held in place by coiled springs 25 mounted in the same manner as those for the upper valve plate 17, around adjusting pins 26 also passed through cross-pieces 27 and cups 28. Said cups are likewise guided within other cups 29 on other cross-pieces 30.

In view of the foregoing it is evident that the operation of the box by the revolution of the shaft will alternately create a vacuum in said box as the sides thereof move outward thereby opening the upper valve and drawing the moisture from the paper on the wire above, and then, as said sides move inward close the upper valve, open the lower one and expel the water and air below. During the operation, the wire bearing the paper passes across above the opening at the top of the box, being supported out of frictional contact with any part of the box by the rollers. The suction created by the rapid vibrations of the diaphragm-sides of the box is so great that the air which is drawn in between the tops of the castings and the wire does not interfere with its successful operation upon the paper on said wire.

While I have shown only one shaft and one pair of eccentrics and links, it should be understood that the number of eccentrics and links on the single shaft or more shafts with one or more pairs of eccentrics and links may be used if desirable without departing from my invention.

I claim:

1. A suction box for paper machines having diaphragms in its sides and means to vibrate said diaphragms to create suction in said box.

2. A suction box for paper machines having each of its sides comprising a diaphragm and means to vibrate said diaphragms to create suction in said box.

3. A suction box for paper machines having each of its sides comprised of a rubber diaphragm provided with a bracing plate at its center and means to vibrate said diaphragms to create suction in the box.

4. A suction box for paper machines having diaphragms in its sides, a revoluble shaft running through said box, eccentrics on said shaft and links between said eccentrics and diaphragms whereby the latter are moved outward together and inward together for the purpose specified.

5. A suction box for paper machines having each of its sides composed of a rubber diaphragm provided with a bracing plate at its center, a revoluble shaft running through said box, eccentrics on said shaft, and links connecting said eccentrics and said diaphragms, the outer ends of said links passed through slots in the rubber and bracing plates and pivoted in blocks arranged on the outer faces of said bracing plates.

6. A suction box for paper machines having diaphragms in its sides, a revoluble shaft running through said box secured to the ends of the box and having upward extensions adapted to be secured to the frame of a paper machine, eccentrics on said shaft and links connecting said eccentrics and diaphragms.

7. A suction box for paper machines having diaphragms in its sides, means to vibrate said diaphragms, valves covering openings in the top and bottom of said box and rollers adapted to support the wire of a paper machine above and out of contact with the top of said box.

8. A suction box for paper machines having diaphragms in its sides, means to vibrate said diaphragms, valves covering openings in the top and bottom of said box, said top comprising two similar castings, each carrying a roller which extends above the top of said castings.

9. A suction box for paper machines having diaphragms in its sides, means to vibrate said diaphragms, two similar castings forming the top of the box, a roller mounted on each of said castings, the inner edges of said castings extended upward between said rollers but spaced apart and terminating below the top of said rollers, and suitable valves arranged below the space between said castings and in the bottom of the box.

10. A suction box for paper machines having diaphragms in its sides, means to vibrate said diaphragms, two similar castings forming the top of the box, a roller

mounted on each of said castings, the inner edges of said castings curved upward conforming to the surface of said rollers but spaced apart and terminating below the top of said rollers and suitable valves arranged below the space between said castings and in the bottom of the box.

11. A suction box for paper machines having diaphragms in its sides, means to vibrate said diaphragms, two similar castings forming the top of the box, a roller mounted on each of said castings, the inner edges of said castings extended upward between said rollers but spaced apart and terminating below the top of said rollers, suitable valves arranged below the space between said castings and in the bottom of the box, coiled springs arranged below the top valve, an adjustable pin extended through each spring and through a cross piece secured between the upwardly extending portions of said castings, cups mounted on the ends of said pins and forming bearings for the lower ends thereof and other cups on lower cross pieces forming guides for said bearing cups.

12. A suction box for paper machines having diaphragms in its sides, means to vibrate said diaphragms, two similar castings forming the top of the box, a roller mounted on each of said castings, the inner edges of said castings extended upward between said rollers but spaced apart and terminating below the top of said rollers, suitable valves arranged below the space between said castings and in the bottom of the box, coiled springs arranged below the bottom valve, cross-pieces across the slot in the bottom within the box, an adjustable pin passed through each spring and cross-piece and carrying a cup on its lower end forming a bearing for the springs, and other cups on lower cross-pieces forming guides for said bearing cups.

In testimony whereof, I affix my signature, in presence of two witnesses.

FRANK MORSE CHAPMAN.

Witnesses:

PHILIP O'CONNELL,
PAUL W. WILLIAMS.