Feb. 3, 1931. O. SEVERINI 1,791,065

SUCTION BOX FOR FELTED SHEET MAKING MACHINES

Filed Jan. 11, 1929

Fig. 1

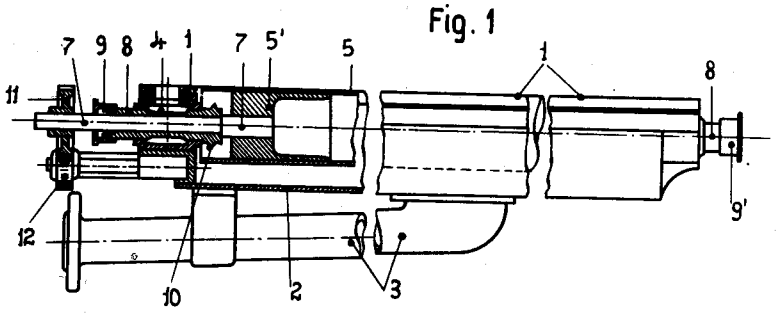


Fig. 2

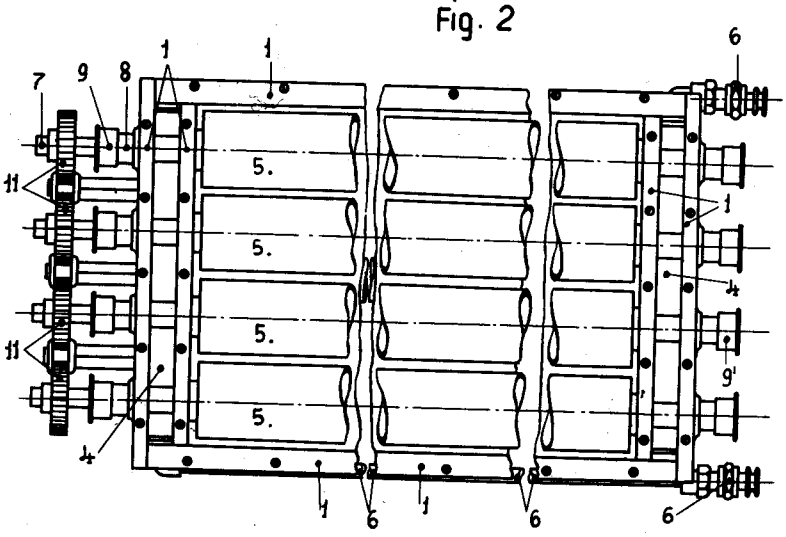
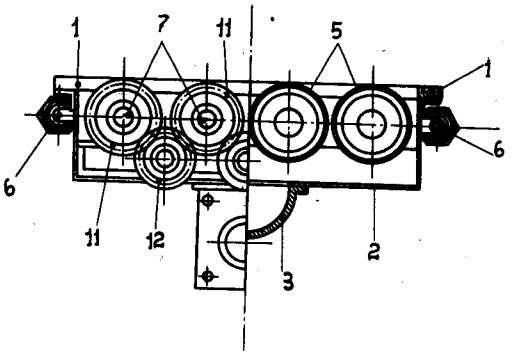


Fig. 3



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UNITED STATES PATENT OFFICE

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SUCTION BOX FOR FELTED-SHEET-MAKING MACHINES

Application filed January 11, 1929, Serial No. 331,916, and in Italy July 14, 1928.

In continuance machines for the initial extraction of the large amount of liquid in the paper pulp or the like which is spread upon the metallic web for the formation of the sheet, use is made of suction boxes comprising a flat upper surface which is perforated or formed by plates or partitions so as to allow of aspiration or suction, upon which the metallic web is supported, and slides along. However when the pulp is of a certain thickness or, due to its composition, presents a resistance to filtration of the liquid greater than normal, an increase must be made in the degree of suction. Then, however, owing to the strong pressure with which the web is pressed against the suction boxes, there is produced so great a frictional resistance as to cause the arrest or stoppage of the web in its sliding movement upon the driving roller or even the breaking of the web itself and the serious drawbacks which result therefrom.

Now the object of the present invention is to provide a suction box by means of which the said drawbacks are completely obviated, because it renders possible an energetic suction and, consequently, a rapid filtration of the pulp liquid for the formation of the sheet even in the case of considerable thicknesses and when the composition of the pulp is such that it presents a great resistance to the filtration of the liquid.

The box forming the subject matter of the present invention is characterized essentially by the fact that the bearing surface for the metallic web comprises a small portion, limited to the box edge, in which sliding contact takes place between the metallic web and the box edge, and a larger portion in which the contact is a rolling one. This remaining larger portion is formed by rollers mounted within the box and tangential to the plane determined by the frame portion of the box and with their axes perpendicular to the direction of movement of the metallic web. These rollers are caused to rotate all in the same direction at a peripheral speed equal to the traverse speed of the metallic web, so that sliding between rollers and web is eliminated.

The suction, produced in the usual way inside the box, is exerted beneath the felt and consequently through the pulp, in the zones comprised between the lines (or practically the narrow surfaces) of contact of the web upon the rollers, and it can be pushed up to the highest degree without any danger to the metallic web, as the sliding friction takes place only on the edge surfaces and the corresponding frictional resistance is reduced or overcome by the motive rollers which are immediately adjacent.

The invention also relates to constructional details which will hereinafter be described.

In the accompanying drawing there is shown, by way of example, a constructional form of the box forming the subject matter of the invention.

Figure 1 is in part a transverse section through the axis of a roller and in part an elevation.

Figure 2 is a plan view thereof.

Figure 3 is in part a section normal to the axis of the roller and in part an elevation.

As already stated the box terminates at the top in a flat frame formed by narrow bands 1, to which the frictional surface-contact of the web carrying the pulp is limited. 2 is the bottom of the box closed as usual at the sides and from which extends the suction conduit 3. 4 are the usual conduits arranged laterally in relation to the box through which conduits water is supplied to form an hydraulic seal laterally between the web and suction chamber of the box. 5 are the roller surfaces suitably constituted by tubes in the ends of which there are fixed the headers 5′, keyed upon the shafts 7 which are supported by the sleeves 8 fixed to the sides of the box and which traverse the conduits 4 with which they form an hermetic joint. At the driving side the shafts 7 traverse a stuffing box 9 and carry the driving gear wheels 11 meshing with the intermediate wheels 12 so as to obtain a rotation of all the rollers in one and the same direction. One of the extreme wheels 11 of the group of rollers of one of the boxes is driven by a suitable transmission so as to give the rollers a peripheral speed equal to the forward movement of the web carrying the pulp. The shafts 7 on the opposite side

of the drive are shorter and the external ends of the sleeves 8 carry lubricators 9'. For the sleeves of the motor shafts 7 the lubricators are arranged laterally. The extremity of the sleeves 8 inside the box is provided with a discharge ring 10 intended to collect the drops of water falling eventually upon the sleeve and to prevent the water from penetrating between the shaft and the sleeve itself. 6 shows the supply pipe for conducting the water to the conduits 4 for the hydraulic seal.

As will be seen from the drawing the friction of the rubbing movement between the metallic web and the box is limited to the narrow bands of the frame and principally to the bands normally in the line of advance of the felt.

Naturally the number of rollers in each box and the structural details may be varied without departing from the scope of the invention.

What I claim is:

1. A suction device for felted sheet making machines, comprising a suction chamber, channels for a sealing liquid extending along opposite sides of the chamber, web supporting rolls mounted in the chamber, spindles on which said rolls are mounted extending through the channels, and collars extending transversely through said channels forming water tight bushings for said spindles.

2. A suction device for felted sheet making machines, comprising a suction chamber, channels extending along opposite sides of the chamber, means for supplying a sealing liquid to the channels, web supporting rolls mounted in the chamber, spindles on which said rolls are mounted extending transversely through the channels, hermetically fixed sleeves extending transversely through said channels into the chamber and forming water tight bushings for the spindles, a stuffing box on each sleeve outside the channel, a moisture collecting ring on each collar inside the chamber, and means for rotating the spindles in the same direction.

3. A suction device for felted sheet making machines, comprising a box constituting a suction chamber, narrow web supporting bands on the upper edge of the box, conduits at the sides of the box for containing a sealing liquid, web supporting tubes mounted in the box, headers in said tubes, spindles keyed to said headers extending through said conduits, and sleeves in which the spindles are journaled extending transversely through the conduits into the ends of the rolls in proximity to the headers and constituting hermetically sealed bushings for the spindles.

In testimony that I claim the foregoing as my invention, I have signed my name.

OSTILIO SEVERINI.