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W. C. NASH

2,270,464

VACUUM ROLL

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Fig. 1.

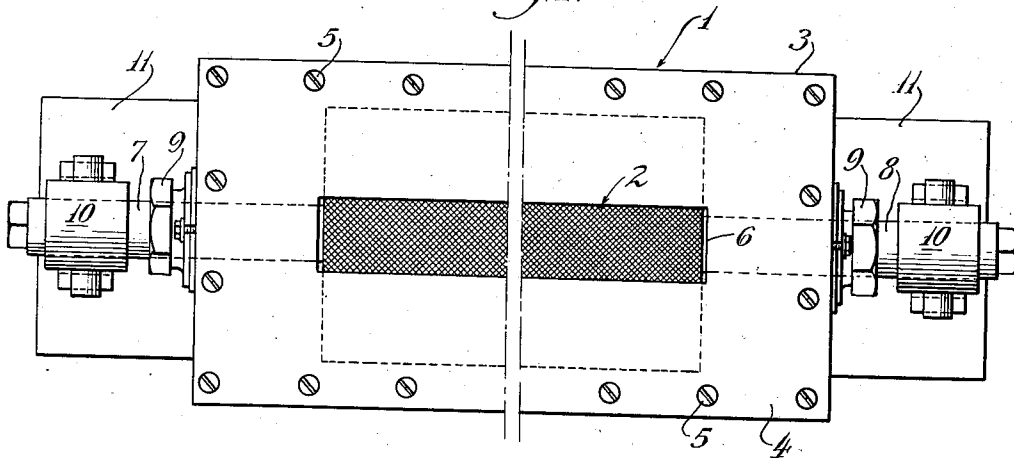


Fig. 2.

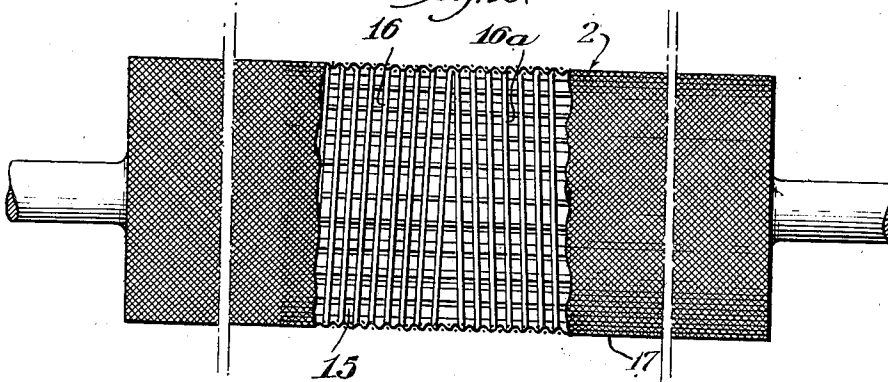
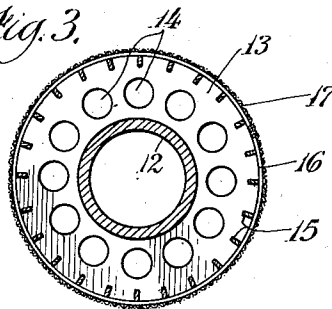


Fig. 3.



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UNITED STATES PATENT OFFICE

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VACUUM ROLL

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4 Claims. (Cl. 92—51)

This invention relates to improvements in suction rolls, particularly suction rolls having screen surfaces utilizable in paper making machines and similar mechanisms.

Wherever suction rolls having screen surfaces are used, for instance, in paper making operations, the screen surface of the roll is brought into rolling contact with a web of paper, a blanket or paper forming wire. Under the influence of the suction there is considerable pressure exerted between the contacting surfaces, i. e., the roll surface and web, blanket or wire surface, and there is a tendency for the screen roll surface to creep, that is, move longitudinally with respect to the roll axis.

One of the objects of my invention is to minimize this creeping tendency by a novel suction roll construction.

Briefly described my invention comprises a skeleton suction roll around which a spiral rib is formed, the angle of pitch of the spiral being reversed at the longitudinal center of the roll, upon which the surface screen is carried.

Other objects and advantages of my invention will be apparent from the accompanying drawing and following detailed description.

In the drawing,

Fig. 1 is a top plan view of a suction box in which my suction roll is used.

Fig. 2 is an elevational view, parts being broken away, of my improved suction roll.

Fig. 3 is a cross-sectional view of the suction roll shown in Fig. 2.

Referring in detail to the drawing, 1 indicates a suction box in which my improved suction roll 2 may be used. The suction box 1 comprises an enclosed box-like body 3 of rectangular transverse and longitudinal section. A top 4 is mounted upon the box 3 and is secured thereon by means of screws 5 which are preferably countersunk to avoid injury to a paper making wire (not shown) which slides over the top 4. An opening 6 is provided in the top 4 through which a portion of the surface of roll 2 protrudes.

The ends of box 3 are provided with opposite openings through which shafts 7 and 8 extend, the openings being sealed by means of packing glands 9. Bearings 10 are mounted upon platform 11, which also carries box 3, shafts 7 and 8 being journaled in said bearings.

Roll 2 is carried by shafts 7 and 8 which are connected at opposite ends of tubular member 12 which constitutes the core of the roll. A plurality of spiders 13 are mounted upon the tubular member 12, said spiders being appropriately spaced

from one another. Each spider 13 comprises an annular ring having a plurality of openings 14 provided in its face whereby vacuum established within box 3 is uniformly transmitted to all parts of the interior of the roll. The periphery of each of the spiders is provided with a plurality of circumferentially spaced, radial slots, and are adapted to receive a plurality of longitudinally extending ribs 15.

A wire 16 is spirally wrapped upon the ribs 15 as supports, said spiral from one end of the roll to its center being pitched in a predetermined direction. A similar spiral wrapping or rib 16a extends from the opposite end of the roll to the center but is pitched in the opposite direction. A sheathing or cover of mesh wire 17 is carried upon the spiralled ribs 16 whereby a foraminated surfaced roll is provided.

As has been hereinbefore described, roll 2 is adapted to be positioned within suction box 3 and a portion of its surface is adapted to protrude through the opening 5. The surface of the roll extends above the surface of the cover and is adapted to support a paper forming wire which, with its supported paper web, passes over the roll 2. Of course, when the wire and supported web passes over opening 5 the vacuum draws the paper forming wire into close contact with the screen surface of the roll. As a consequence any lateral shifting of the paper forming wire tends to move the screen cover 17 longitudinally of the axis of the roll.

By the provision of the oppositely pitched spiral wraps such movement of the cover, or "creep" is effectively prevented. This, of course, is conducive to long life of the roll surface which normally wears out very quickly.

The suction box 3 may, if desired, be utilized in conjunction with the removal of water from felts used on paper making machines. In case of such use the roll may be employed without the screen cover 17, in which event the felt rides upon the spiralled wire surface. The oppositely pitched spirals tend to cause the felt to track properly and in addition the oppositely pitched spirals tend to stretch the felt transversely opening up the pores of the felt at the time when the felt is being subjected to vacuum. This, of course, greatly facilitates the removal of moisture from the felt.

If the roll is used as a suction roll for felts, the spiral ribs 16 may be separated a greater distance from each other, that is, the pitch may be greater than if the roll is to be covered by the screen 17. The suction roll thus used will greatly

increase the life of the felts. It may be employed with a shower to thoroughly clean the felt. By its use a denser felt may be used with the assurance of lack of filling and longer life. The spiral ribs keep the felt open and thus free to couch water at the presses.

I claim as my invention:

1. A substantially hollow vacuum roll for use in conjunction with a suction box of the type having an opening in its upper surface through which a portion of the roll surface protrudes and over which a flexible web passes, comprising a core, a roll skeleton carried by said core, spiral ribs carried on the periphery of said roll skeleton, said spiral ribs being pitched in one direction only from an intermediate portion of said roll to an end thereof, and being pitched in the opposite direction only from said intermediate portion to the opposite end of the roll, the loops of said spiral ribs being spaced to provide communication into the interior of the roll.

2. A substantially hollow vacuum roll for use in conjunction with a suction box of the type having an opening in its upper surface through which a portion of the roll surface protrudes and over which a flexible web passes, comprising a core, a roll skeleton carried by said core, spiral ribs carried on the periphery of said roll skeleton, said spiral ribs being pitched in one direction only from an intermediate portion of said roll to an end thereof, and being pitched in the opposite direction only from said intermediate portion to the opposite end of the roll, the loops of said spiral ribs being spaced to provide communication into the interior of the roll, and a foraminated surface member carried upon and covering said spiral ribs.

3. A substantially hollow vacuum roll for use in conjunction with a suction box of the type having an opening in its upper surface through which a portion of the roll surface protrudes and over which a flexible web passes, comprising a core, a roll skeleton carried by said core comprising a plurality of spiders mounted upon said core in spaced relation, a plurality of longitudinal ribs carried upon said spiders, spiral metallic ribs carried upon said longitudinal ribs, said spiral ribs being pitched in one direction only from an intermediate portion of said roll to an end thereof, and being pitched in the opposite direction only from said intermediate portion to the opposite end of the roll, the loops of said spiral ribs being spaced to provide communication into the interior of the roll.

4. A substantially hollow vacuum roll for use in conjunction with a suction box of the type having an opening in its upper surface through which a portion of the roll surface protrudes and over which a flexible web passes, comprising a core, a roll skeleton carried by said core comprising a plurality of spiders mounted upon said core in spaced relation, a plurality of longitudinal ribs carried upon said spiders, spiral metallic ribs carried upon said longitudinal ribs, said spiral ribs being pitched in one direction only from an intermediate portion of said roll to an end thereof, and being pitched in the opposite direction only from said intermediate portion to the opposite end of the roll, the loops of said spiral ribs being spaced to provide communication into the interior of the roll, and a foraminated surface member carried upon and covering said spiral ribs.

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