April 30, 1963 E. R. LJUNGQUIST 3,087,184

VIBRATORY DOCTOR MECHANISM

Filed Nov. 17, 1960

FIG. 1

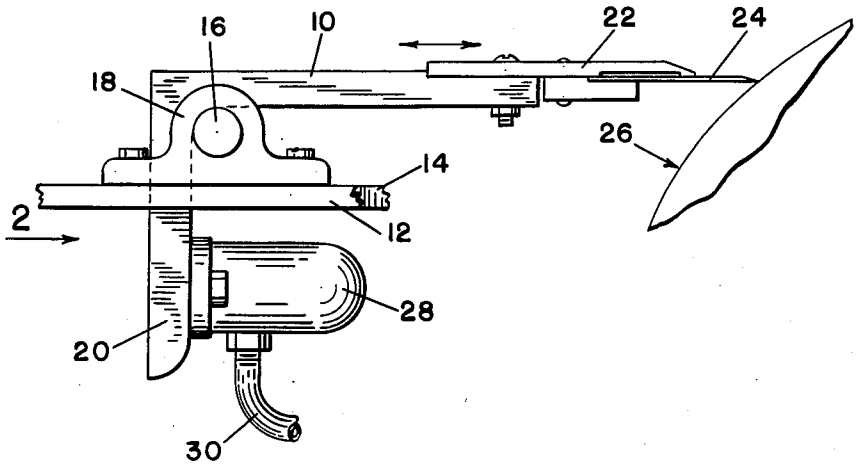


FIG. 2

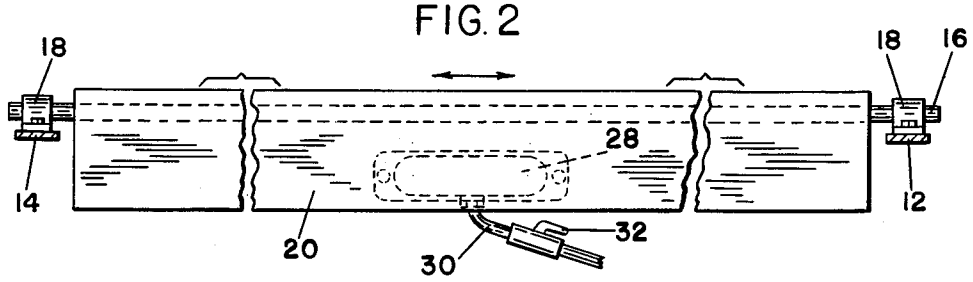
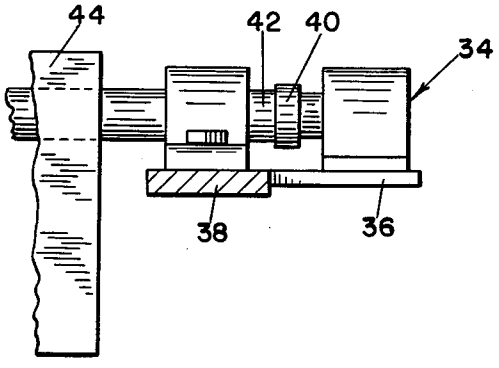


FIG. 3



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VIBRATORY DOCTOR MECHANISM

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This invention relates to an improvement in doctors and doctor blades relating particularly to doctors for the paper making industry but usable wherever found desirable or convenient.

The object of the invention is to provide a very short stroke high-frequency oscillatory motion to the doctor blade. The doctor blade is applied to the roll or surface to be treated under some pressure, and in the usual course of operation, detritus, fuzz and the like builds up both on top of the blade and under the blade, resulting in inefficient operation so that the blade must be cleaned periodically. The present inventor has found that by providing the blade with a very short stroke, high-frequency oscillatory motion, he is enabled to provide the doctoring operation in the manner of the prior art but at the same time the blade becomes self-cleaning. Due to the vibratory action, small particles on the roll are broken up and more easily fall from the roll and are more easily cleared therefrom, and this provides for the fact that these pieces of fuzz or detritus do not tend to build up under the blade.

In addition, by providing the blade with a very slight slant with relation to the horizontal axis of the roll, detritus and fuzz on the top of the blade moves itself down the incline due to the vibratory action, and thus the blade is self-cleaning from two different aspects, both because of the fact that it tends to break up and release small pieces of fuzz which are then easily cleared off and do not tend to cling to the blade and also because the vibratory action itself causes the material to move along the length of the blade to one end thereof where it can be conveniently removed.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly set forth in the appended claim.

Reference is to be had to the accompanying drawings, in which

FIG. 1 is a view in side elevation illustrating the invention, parts being cut away and removed for clarity of illustration;

FIG. 2 is a view in rear elevation looking in the direction of arrow 2 in FIG. 1 but on a smaller scale; and

FIG. 3 shows a modification.

The construction of the present invention is a very simple one, and in fact may be according to any conventional doctor blade and doctor construction.

Briefly, such a construction is provided by a doctor back **10** which essentially is an angle iron extending across the machine between machine frame members **12** and **14** and located between the same by being mounted on journals **16** which are in turn mounted on bearings **18** located on the frame members **12** and **14**. The journal or journals **16** can conveniently comprise cylindrical rods attached in any manner desired at the angle of the angle iron **10**. This angle iron **10** of course has an angular

portion **20** which extends along the machine in conformance with the member **10** upon which the blade holder **22** is mounted. Blade holder **22** may be completely conventional and it holds a conventional blade **24**.

The doctor construction **10** in general is provided with a very high speed short range vibratory action. It is preferred that bearings **18** should hold the journals **16** loosely so that the journals and the entire doctor construction can vibrate axially and in accordance with the arrows shown in FIG. 2 without hindrance.

The vibratory action is in the plane of the blade **24** normal to the blade edge as shown by the arrows in FIG. 1, and is also at a right angle thereto but in the same plane as shown in FIG. 2 by the arrows. The blade **24** vibrates in its own plane back-and-forth with respect to the surface **26**, and it also moves longitudinally thereof and may be said to have a combined motion in this respect.

Furthermore, this vibratory action can be applied to the doctor back **10** or it can be applied directly to the blade **24**. In the latter case, the doctor construction **10** would not itself vibrate to any great extent, but where the vibration is directly applied to the doctor back **10**, then of course this member vibrates and in turn vibrates the blade **24**. The effect of this is that the blade **24** is held correctly as desired but is vibrated with a very short range high speed action.

This vibratory action can be provided for in many ways as for instance by electrical vibrators of well known construction. As shown, however, a "Vibrolater" **28** is provided, this being a commercial device manufactured by Martin Engineering Corporation of Neponset, Illinois, and it is an air driven device having a hose **30** supplying air into a chamber in the housing, there being a ball in the housing which is rapidly traveled around a closed path by the air. The air is easily controlled by a hand-operated valve **32** even while the roll **26** is operating, and therefore the device may be adjusted for amplitude, etc. of vibration, even while the machine is running.

If the doctor construction **10** should be mounted on the machine parts **12** and **14** at a slight angle to the axis of the roll, any detritus forming at the top side of the blade **24** will automatically feed itself away from the roll to one end of the blade where it is easily collected by known devices.

In the construction shown in FIGS. 1 and 2, the Vibrolater is attached directly to the portion **20** of the doctor, but it could be applied to the back **10**, to the holder **22**, or to the blade **24**.

Furthermore, as shown in FIG. 3, a vibrator type of device or high speed vibratory mechanism generally indicated at **34** and well known in the art could be mounted on a platform **36** on the frame member **38** which is equivalent to that at **12**, and then it may be connected by a link **40** to the journal **42** which is equivalent to that at **16**, thus vibrating the entire doctor **44** in the manner described above. Also of course the blade itself could be attached to the vibrator **34** and not through the intermediary of the holder, if desired.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

A doctor blade construction comprising a support, bear-

ings on said support, said bearings being spaced, journals in the bearings, the journals being free for axial motion in said bearings, a doctor back mounted on said journals, a blade holder on the doctor blade, a doctor blade mounted in the blade holder, and vibratory means mounted on said doctor back for moving the doctor back and its blade in a direction axially with respect to said journals, said vibratory action being comparatively short and rapid, the vibratory means also providing a component of vibratory action in the plane of the blade and at right angles to the axis of the journals.

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