

[54] **DOCTOR BLADE HOLDER**

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 162/281, 282

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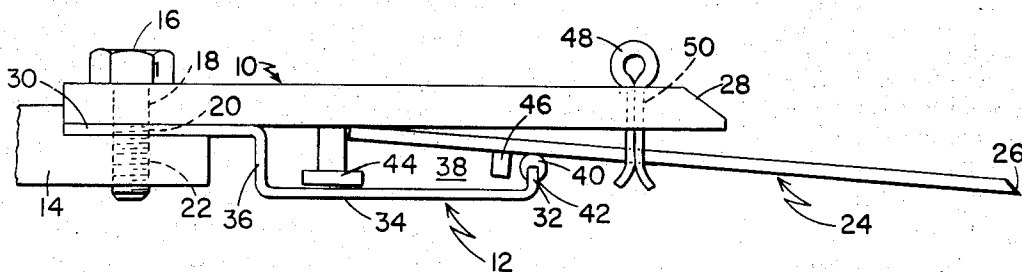
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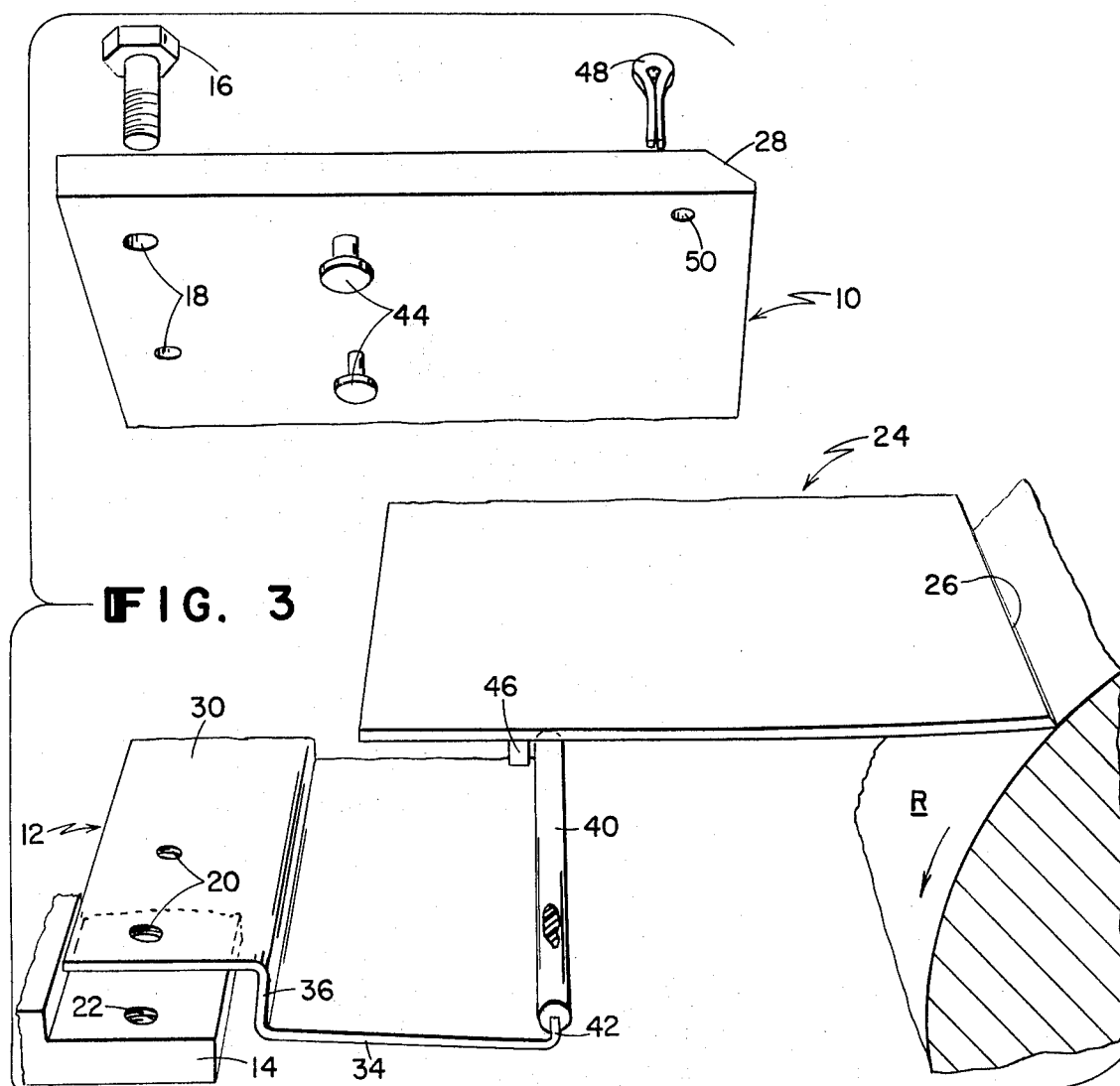
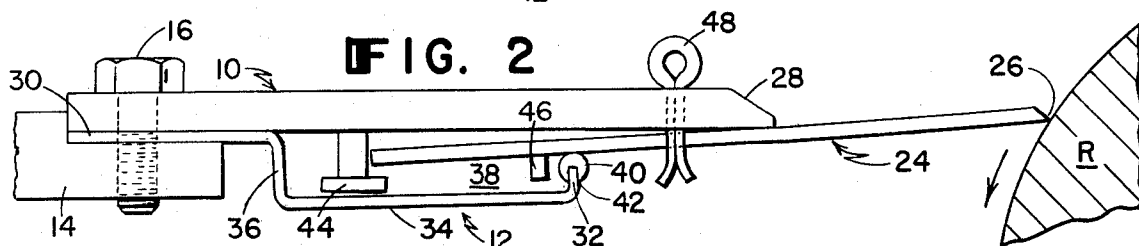
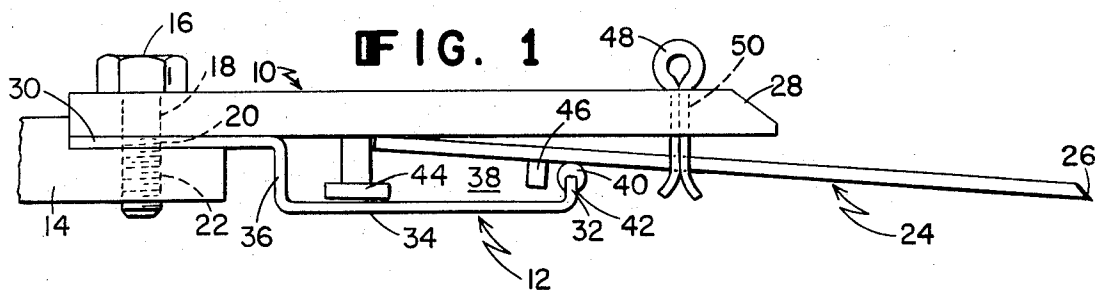
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[57] **ABSTRACT**

A doctor blade holder has a pair of holder members which retain the back edge of a doctor blade between them, one member exerting resilient pressure on the blade to urge it toward the other member through a resilient yieldable strip mounted thereon, the arrangement providing desirable flexibility for the blade and also providing sealing.

5 Claims, 3 Drawing Figures





DOCTOR BLADE HOLDER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to holders for doctor blades, particularly for such blades used for doctoring rolls and the like such as the rolls and cylinders of paper and pulp making machines.

2. Description of the Prior Art

One of the important considerations in the design of doctor blade holders of the type concerned has been to provide sufficient firmness of support while yet permitting the blade to flex under the forces applied thereto by the rotating surface engaging its edge. Such flexing is important to permit the blade to adjust itself to irregularities of the surface and in response to differences in amount and adhesion of the material to be doctoring from the rotating surface.

Numerous holder structures have been used or proposed for providing such flexibility, including: springs attached to the blade and bearing against the holder, see e.g. U.S. Pat. No. 3,377,644; inflatable tubes or coil springs on the holder bearing on the blade, see e.g. U.S. Pat. Nos. 1,566,358, 2,914,788, and 3,529,315; a rocking holder pneumatically cushioned, see e.g. U.S. Pat. No. 3,163,878; and various loosely held spring plates or spring and keep plates, see e.g. U.S. Pat. Nos. 2,287,350, 2,890,473, and 3,596,305. All such devices have had shortcomings of one sort or another such as expense, too many parts, too much blade looseness, difficulties of assembly and disassembly, and so on.

With virtually all prior art doctor holders difficulty has been experienced with doctoring debris wedging its way into the spaces between the blade and the holder, accumulating and packing to such an extent as to seriously impair the normal operation of blade and holder and also to make it very difficult to remove and replace a blade. U.S. Pat. No. 3,526,017 minimizes this problem by providing a suction system for debris removal overlying the blade and holder, but such apparatus is expensive. In regard to blade removal difficulties, U.S. Pat. No. 3,010,134 provides an inflatable cavity between holder jaws to pry them apart, but again such provision is expensive.

SUMMARY OF THE INVENTION

An object of this invention is to provide a doctor blade holder of the type concerned in which the blade is held with more of the desirable flexibility than is attained with holders of the prior art, but which is not expensive to make and with which it is easy to assemble and disassemble the blade.

Another object is to provide such a holder in which accumulation of debris within the holder is inhibited.

Still another object is to provide such a holder in which endwise withdrawal and replacement of blades is facilitated.

In attaining the foregoing objects, the invention features a blade holder having a pair of holder members arranged for mounting on a support and to receive and retain between them the back portion of a doctor blade, with its front portion protruding from between them so that its beveled edge is in doctoring position against the rotating surface. One of the members, preferably of spring metal, resiliently urges the blade to-

ward the other member and has mounted thereon a resilient, yieldable strip which bears against the blade and through which the pressure of the member is exerted. This strip is deformable under pressures exerted thereon to increase the flexibility of the blade in the mounting and also acts as a seal between holder member and blade to inhibit passage of doctoring debris between them. Preferably the surface of the strip engaging the blade has a low coefficient of friction compared to the blade surface so that the blade surface will slip thereon, facilitating endwise withdrawal of blades from, and their endwise insertion in, the assembled holder.

In a preferred embodiment, one of the holder members is a flat strip of relatively inflexible metal having bolt holes at its rearward end for mounting on a support, and a beveled forward end. The other holder member is of relatively flexible and resilient spring steel and has a flat rearward portion with bolt holes arranged to align with the bolt holes in the first member so that the two members are assembled together by mounting on the support. Adjacent the bolt holes and at its forward end the flexible member is bent at substantially a right angle, the bent portions and an intervening flat portion forming a channel between the members when assembled.

In such preferred embodiment, the yieldable strip is of plastic composition with a longitudinal slot into which the bent forward end of the flexible member may be forced to mount the strip on the member, so that the member urges the strip against the blade under resilient pressure. The inflexible holder member has positioning projections extending into the channel. The back end of the blade is inserted between the holder members, with its rearward edge against the positioning projections and is held between the members by resilient pressure exerted by the resilient member through the strip. The blade is provided with lugs which project into the channel to engage the strip and prevent undesired forward removal of the blade from the holder, although permitting endwise sliding of the blade out of the holder.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. 1 is an end view of a preferred embodiment of the holder of the invention mounted on a support partially shown and with a doctor blade held therein in non-working position;

FIG. 2 is a view similar to FIG. 1 showing the blade in working position against a roll; and

FIG. 3 is an exploded partial perspective view of parts shown assembled in FIGS. 1 and 2.

In the drawing, the two holder members are designated generally 10 and 12, respectively. In FIGS. 1 and 2 they are shown assembled together and mounted on a support 14 by means of bolts 16 extending through registering bolt holes 18 in the rearward part of member 10, and 20 in the rearward part of member 12, and received in threaded apertures 22 in support 14. The back portion of a doctor blade 24 is held between the members with its forward portion protruding between them and with its beveled front edge 26 in position for doctoring engagement with the surface of a roll R partially indicated in FIG. 2, rotating in the direction of the arrow. It will be understood that the holder members,

the doctor blade and the support extend the full axial length of the roll surface to be doctored.

Holder member 10 is a flat bar of relatively rigid metal which has a beveled forward end or nose 28. Member 12 has a flat rearward portion 30 containing bolt holes 20 which seats on support 14 and against the adjacent surface portion of member 10. Member 12 has its front portion 32 bent at substantially a right angle to the contiguous portion 34. A portion 36, between portions 34 and 30 is similarly bent so that portions 36, 34 and 32 form a channel 38 which is between the members when they are assembled. In accordance with the invention, resilient, yieldable strip material, which may be of a plastic composition, is mounted on front portion 32 of member 12. As shown, this material is a single strip 40 formed with a longitudinal slot 42 and is mounted on member 12 by forcing end portion 32 of that member into slot 42, spreading the portions of the strip at opposite sides of the slot which firmly grip portion 32 between them adjacent its base to hold strip 40 in place. Strip 40 is deformable under pressures applied thereto against the blade to increase the flexibility of the mounting. Strip 40 preferably also has a surface with a low coefficient of friction, lower than that of the blade surface which it contacts, so that the blade readily slips on it. A strip of nylon impregnated with moly-disulfite has been found satisfactory but various other compositions or materials can be used.

Member 10 is provided at intervals with flat-headed positioning studs 44 which project therefrom into channel 38, the stems of these studs engaging the back edge of doctor blade 24 to limit its rearward position in the holder. The surface of blade 24 opposite its doctoring surface is provided at intervals with bosses 46 projecting into channel 38 and so spaced from the back edge of the blade that they are contiguous to the side of strip 40 when the back edge of the blade is against positioning projections 44. Bosses 46 prevent forward removal of blade 24 from the holder unless the holder members are pried apart. Endwise sliding of the blade from the holder is prevented by cotter pins 48 extending through apertures 50 in holder member 10 at each end edge of the blade.

Preferably, the back end of the blade is loosely held between member 10 and strip 40 on member 12 so that in the non-working position of the blade shown in FIG. 1, the blade is free to pivot on strip 40 in the clockwise direction in FIG. 1 until its rear edge engages the underface of member 10, the blade being supported by member 12 on strip 40 at a slight incline. When the blade is placed in a working position against a roll as shown in FIG. 2, it is pivoted in the reverse direction so that its rear edge is away from member 10, while forwardly of strip 40 the blade engages the front underside of nose 28 of member 10 about which it can pivot to the extent permitted by limiting engagement of its rear edge with the heads of studs 44 and the underside of member 10. The edge 26 of the blade is thus resiliently held against the roll by the spring pressure of member 12 cushioned through strip 40 urging the blade to pivot in the clockwise direction in FIG. 2 about its point of engagement with the under edge of nose 28. In addition to its contribution to the flexibility of the mounting, strip 40 is an effective seal preventing doctored debris from entering the channel 38 between the members and so to impair their operation.

Assembly and disassembly of the embodiment shown is relatively simple. The two holder members may be assembled on the support with their bolt holes aligned with one another and with the apertures, and the bolts applied through the holes into the apertures. The doctor blade may then be assembled to the holder by sliding its back portion into channel 38 between projections 44 and strip 40, and applying cotter pins 48 to prevent further endwise sliding of the blade. For blade replacement one cotter pin is removed, the old blade is pulled out from that end and the new blade is inserted as just described.

Each holder member may be provided in one piece the full axial length of the rotary surface to be doctored, or either or both may be provided in multiple sections to be assembled end to end. If both members are sectioned, it is preferred that the section ends of one member alternate between section ends of the other, so that the section ends of one member are overlaid or underlaid by a continuous portion of the other member. The two holder members may be joined together at their back ends if desired, as by welding. However, the separate arrangement shown is preferred since it provides a longer effective lever arm for member 12. The doctor blade may be made of metal or of plastic or other suitable composition.

In case a holder is wanted wherein insertion and removal of the blade can be readily accomplished from the front, turned up front portion 32 of member 12 and strip 40 thereon are cut away at intervals corresponding in spacing to the spacing of bosses 46 to form openings of a depth and width sufficient to permit the bosses 46 to pass through the openings when a blade is slid from the front between members 10 and 12. After insertion from the front, the blade is slid longitudinally to its position determined by cotter pins 48, so that bosses 46 are located between these openings and accidental frontward dislodgement of the blade will be prevented by engagement by bosses 46 with strip 40 between the openings.

I claim:

1. A holder for a doctor blade for doctoring rolls and the like comprising:

a pair of holder members constructed and arranged to be secured together to a support adjacent one of their longitudinal edges with their opposite edges free for receiving and retaining the back portion of a doctor blade between them with its doctoring edge projected beyond them and with one member resiliently urged toward the other member to exert sufficient pressure on said blade to hold it in operative position against the other member;

said one member being formed of resilient metal and being arranged to be fastened to the other said member adjacent their edges remote from the doctoring edge of a said blade received between them so that the other edge of said one member is flexible toward and away from the other said member;

said one member having mounted thereon adjacent said other edge thereof a resilient, yieldable strip material extending longitudinally of said member and blade and positioned so that said one member exerts said pressure on said blade through said material, said material being deformable under said pressure;

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and means to secure said holder members to a said support with said other member preceding said one member in the direction of rotation of the surface to be doctored.

2. A holder according to claim 1 wherein said one member is spaced sufficiently from the other member to permit the blade to pivot on said strip so that its back edge is movable toward and away from each member.

3. A holder according to claim 1 wherein the blade engaging surface of said strip material has a lower coefficient of friction than the blade surface engaged thereby.

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4. A holder according to claim 1 wherein said other edge of said one member is bent to extend toward a said blade received between said members with its edge adjacent said blade, and said strip material has a longitudinal slot therein into which said other edge of said one member is received to mount said material thereon.

5. A holder according to claim 1 wherein said doctor blade is provided with lugs projecting toward said one member when said blade is received between said members and contiguous to the rear face of said strip.

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