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2,487,409

DOCTOR BLADE AND MOUNTING

Filed Dec. 21, 1945

2 Sheets-Sheet 1

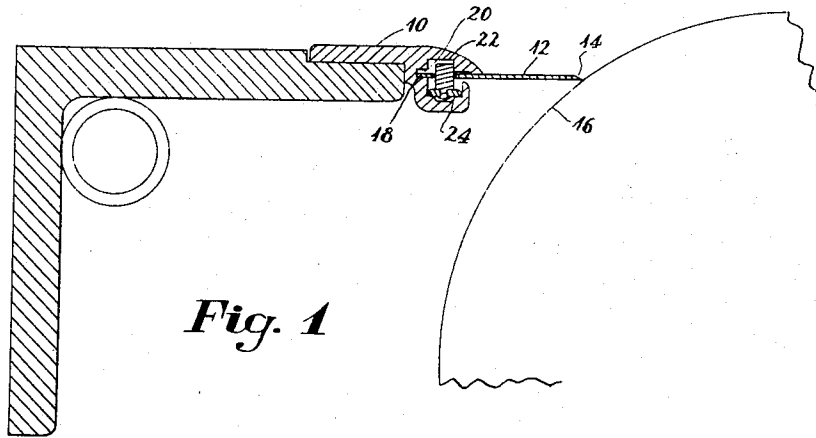


Fig. 1

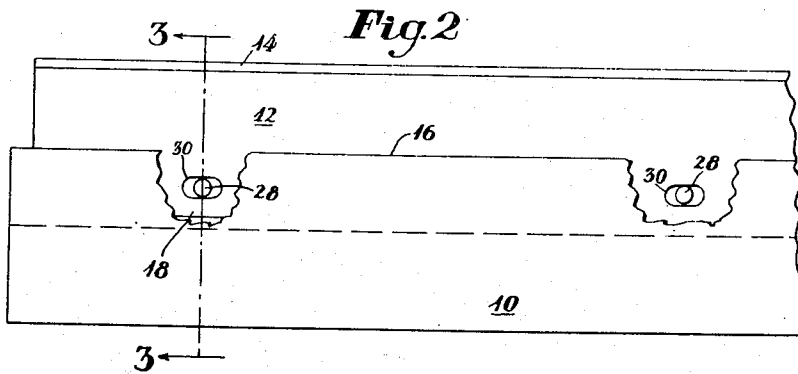


Fig. 2

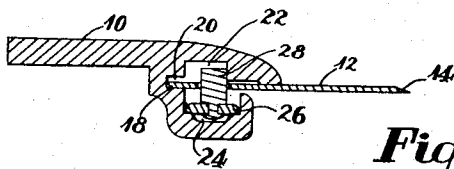


Fig. 3

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Fig. 4

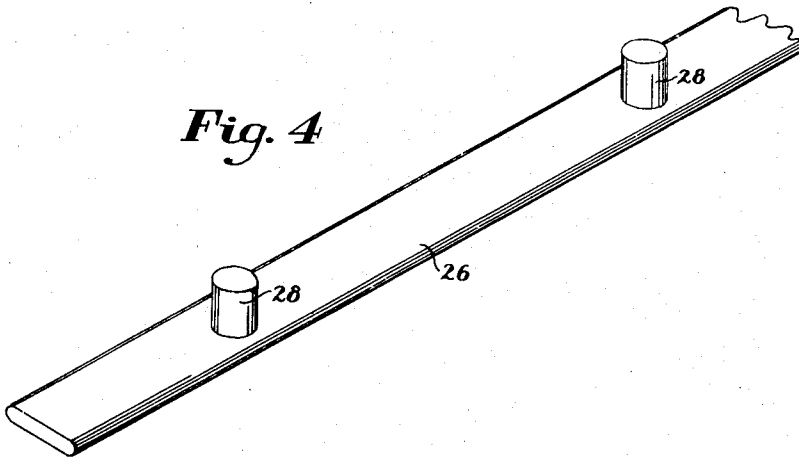
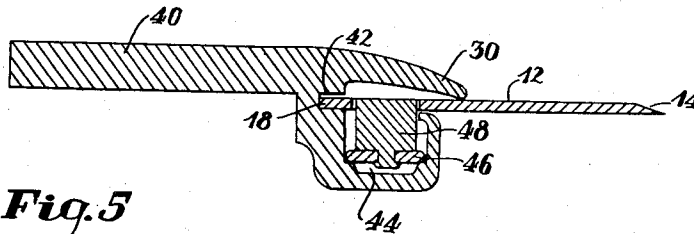


Fig. 5



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2,487,409

DOCTOR BLADE AND MOUNTING

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2 Claims. (Cl. 92-74)

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It is the primary object of this invention to improve the doctor blade construction disclosed in the patent to Vickery 1,912,605 and such improvement provides not only more effective behavior of the doctor blade itself but also results in greatly increased economy of operation.

The above and other objects will be made clear from the following detailed description taken in connection with the annexed drawings in which:

Figure 1 is a cross section illustrating the general relationship of the blade, of the blade holder and the roll;

Fig. 2 is a plan view partially in section showing the relationship of the blade and holder;

Fig. 3 is a section on the line 3-3 of Fig. 2;

Fig. 4 is a perspective view of the portion of the locking strip; and

Fig. 5 is a section similar to Fig. 3 but showing a modified construction.

The use of doctors on paper machines involves problems which are not encountered in any other use to which doctors are put. The first and most striking problem arises out of the extreme width encountered in the various rolls of paper machines and consequently the extreme length of the doctor. This may run in excess of 300 inches and obviously quite different conditions may be encountered from one end of the blade to the other. The second problem lies in the extreme surface speeds of the rolls to be doctored which are frequently as great as 1,500 feet per minute and, in some of the light weight papers, over 2,000 feet per minute. The effect of this surface speed is to generate a great deal of heat at the line of contact between the roll and the blade. The third problem arises out of the fact that paper making machines by their very nature are required to operate continuously for long periods and any interruption of production involves serious economic loss.

The patent to Vickery 1,912,605 was an outstanding contribution to the art since it marked the first recognition of the principle which has now become the standard of the industry, namely, that the blade is to be brought into accurate conformity with variations in the surface of the roll being doctored. The patent is further noteworthy in combining of the application of the principle aforesaid with a locking of the blade against transverse withdrawal from its holder while permitting sliding and endwise removal of the blade from the holder. The present invention improves on the Vickery construction by providing a doctor blade in which there are no increases of thickness and which may be produced

at an irreducible minimum of cost. The blade is distinctly a consumable element and must frequently be replaced. Accordingly, any economy in the cost of replacement blades is a material contribution to the economy of the installation.

Referring now to Fig. 1, there is shown a blade holder 10 in which is mounted a blade 12 having one edge 14 bearing against roll 16. The opposite edge 18 of the blade 12 rests in a groove 20 in the holder 10. Adjacent to groove 20 is an upper supplementary groove 22 and a lower supplementary groove 24.

The parts just described are shown on a larger scale in Fig. 3 in which it will be noted that the groove 20 provides considerable clearance above the upper surface of the edge 18 of the blade 12. This permits free longitudinal flexure of the blade to permit the active edge 14 to conform to variations in the surface of the roll 16. A thin flexible strip of spring steel 26 having a length substantially equal to the blade 12 rests in the lower groove 24. Along strip 26 there are provided projections 28 in the form of rivets. These projections pass through apertures 30 in the blade 12 and into the upper groove 22. The apertures 30 are preferably elongated in the direction of blade length and are of a width to provide a distinctly loose fit around the projections 28.

Fig. 5 illustrates a modified form of holder 40 having a groove 42 to receive the rear edge 18 of the blade 12. The holder 40 is provided with a lower auxiliary groove 44 but has no upper groove corresponding to the groove 22 of the holder 10. A strip 46 having projections 48 rests in the groove 44 with the projections 48 passing through apertures 30 in the blade 12. The projections 48, however, do not penetrate substantially beyond the upper surface of the blade 12 and the holding of the blade against transverse withdrawal is, therefore, accomplished entirely through the lower groove 44.

While the projections have been illustrated as rivets, it is clear that bolts, struck up tongues, cotter pins, welded lugs or any other form of projection might be used without departure from the spirit of this invention. In Figs. 4 and 5 the thickness of the strips 26 and 46 has been exaggerated in order to bring out the fact that the side edges of the strips are preferably rounded to minimize the chance of the strips sticking in the grooves or becoming packed in the grooves by fine dust turned up by the blade.

It will be clear from the foregoing that this invention provides a blade which may be manufactured, stored and handled at absolute mini-

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mum cost. The strips 26 and 46 with their projections are permanent parts of the installation so that the cost of the locking means has been transferred from the consumable blade element to a permanent portion of the installation. Since a great many doctors are used on a single paper machine and since the life of the blade is relatively short, this is a factor of considerable importance in the cost of annual operations. In addition this construction provides for the first time a flexible doctor blade of uninterrupted cross section and a support in which both edges of the blade enjoy complete freedom of flexure.

The flexibility afforded both edges of the blade meets the problem of variations in the roll surface occurring over the great length of the blade. The uniformity of thickness provides a maximum opportunity for the dissipation of heat and for the equalization of temperature between the front and rear edges of the blade, while the relatively loose fit of the parts expedites blade changes and, therefore, shortens monthly or annual shut-down time and decreases the quantity of defective paper occasioned by the changing of blades. The present invention, therefore, attacks directly the three major problems encountered by doctor blades, namely, the problem of length; the problem of surface speeds and the problem of continuity of operations.

While certain specific embodiments have been disclosed herein it is not intended that this invention be limited to the precise details disclosed but only as set forth in the subjoined claims which are to be broadly construed.

I claim:

1. A doctor for use in connection with the rolls of papermaking machines, comprising a

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holder provided with a recess along its length adapted to receive one edge of a doctor blade, grooves opening into the opposed walls of said recess, a narrow, elongated strip of resilient metal slidably received between the walls of one of said grooves and having a plurality of spaced projections fixedly secured thereon and extending across said recess into contact with a wall of the other groove, and a doctor blade in said recess and provided with spaced apertures each loosely passing one of the projections on said strip.

2. A doctor for use in connection with the rolls of papermaking machines, comprising a holder provided with a recess along its length adapted to receive one edge of a doctor blade, a groove in said holder communicating with said recess, an elongated strip of resilient material slidably received between the walls of said groove and having a plurality of spaced projections fixedly secured thereto and extending into said recess, and a doctor blade in said recess provided with a plurality of spaced apertures each loosely receiving one of the projections on said strip.

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The following references are of record in the file of this patent:

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