ABSTRACT OF THE DISCLOSURE

An anchor for holding the edging of a printing blanket by biasing an abutting surface of the edging into engagement with a retaining groove formed in a channel member. Provision is made for locating the edging in a predetermined longitudinal position in the channel member.

This invention relates to printing blanket edging and anchoring means and, more particularly, to a new and improved apparatus for anchoring the edge of a printing blanket to a cylinder of a printing press.

Offset printing presses, such as those used for planographic printing, employ a rubber sheet known as a blanket, which is a heavy cotton backing coated with rubber, or preferably several plies of alternating layers of fabric and rubber. The blanket is fastened around the machined periphery of the offset cylinder to pick up the ink design or image deposited thereon by the inked printing plate for transfer onto the paper to be printed. The offset cylinder, on which the blanket is fastened, is provided with a gap or opening in its periphery into which the ends of the blanket are inserted and anchored. The leading edge of the blanket is provided with a strip or edging which is inserted and held in the cylinder opening. The blanket is then wrapped around the cylinder, and the tail end of the blanket is inserted in the gap of a reel rod disposed within the cylinder opening, after which the reel rod is wound to take up the slack so as to insure a tight fit of the blanket against the surface of the cylinder.

My Patent No. 3,296,673, which issued Jan. 10, 1967, discloses an edging for the leading and tail edges of a printing blanket, as well as an anchoring clamp for securing the edging to the cylinder and the reel rod. In particular, the anchor clamp comprises a body portion which receives the edging, the edging being retained in engagement with the body portion by means of a locking plate screwed thereto.

In accordance with the present invention, I have provided an improved edging which may be rapidly inserted into, or withdrawn from, locking engagement with an anchor clamp, provision being made to insure that the edging is in a predetermined longitudinal position in the clamp. More particularly, the clamp and the edging are provided with cooperating registration elements, and means are disposed in the clamp for biasing an abutting surface of the edging into engagement with a cooperating retaining surface of the clamp.

All of the above is more fully explained in the following detailed description of a preferred embodiment of the invention, this description being illustrated by the accompanying drawings wherein:

FIG. 1 is a partial view in section of a conventional offset cylinder to which a rubber blanket is mounted by means of typical blanket edging and anchoring apparatus embodying the present invention;

FIG. 2 is an enlarged view in perspective of the central portion of the edging and anchoring apparatus of FIG. 1;

FIG. 3 is an enlarged perspective view of the edging of FIG. 1;

FIG. 4 is an enlarged end view of the edging and anchoring apparatus of FIG. 1 as the edging is being inserted into or withdrawn from the anchor clamp;

FIG. 5 shows the edging fully seated in the anchor clamp;

FIG. 6 shows an enlarged end view of the edging of FIGS. 1–5.

As shown in FIG. 1, a rubber blanket 10 is mounted to a typical offset cylinder 12 by means of typical edging and anchoring apparatus according to the present invention. The leading edge 10a of the blanket is provided with an edging 14 which is received in an anchor clamp 16. The anchor clamp 16 is mounted by a plurality of screws 18 to the cylinder 12 in an axially disposed opening 20 therefrom. After the leading edge of the blanket is so secured, the blanket is wrapped tightly around the cylinder 12, and the tail edge 10b of the blanket, which is provided with an edging 14' identical to the edging 14, is secured to a reel rod 22 by means of an anchor clamp 16', which is identical to the anchor clamp 16. The anchor clamp 16' is secured to the reel rod 22 by a plurality of screws 24. After the edging 14' is inserted into the anchor clamp 16', the reel rod 22 is turned in the direction of the arrow 26 until the blanket is tightly wound around the cylinder 12.

Referring now to FIGS. 2 and 3, the anchor clamp 16 comprises a channel, preferably of anodized extruded aluminum or steel, having an exterior rear portion 28 contoured to fit the contour of the machine surface on which it is mounted. Thus, the exterior rear surface 28 could be formed with a shoulder which engages a cooperating shoulder of the cylinder or reel rod. The clamp 16 is a channel member, generally C-shaped in cross section, having an opening 30 through which the edging 14 may be inserted or withdrawn. The clamp 16 is formed with an upper groove 32 which is shaped to receive a retaining rib 34 comprising the upper abutting surface of the edging 14.

The exterior upper surface of the anchor clamp 16 is preferably generally curved in cross section and is formed with a plurality of spaced pointed ridges 36 which extend longitudinally of the clamp in substantially parallel relation with the upper groove 32 thereof. The sharp ridges or teeth 36 are adapted to bite into, but not through, the blanket 10 when the blanket is mounted on the cylinder 12 (see FIGS. 1 and 5). The teeth 36 thus assist the edging 14 in securely gripping the leading and tail edges of the blanket. Furthermore, by making the upper exterior surface of the clamp generally curved in cross section, the gripping force provided by the teeth 36 of the clamp 16 on the leading edge 10a of the blanket is distributed over a large number of the teeth, and more teeth of the clamp 16 grip the tail edge 10b of the blanket as the reel rod is rotated to wind the blanket tighter around the cylinder 12.

The anchor clamp 16 is provided with a lower groove 38 which is adapted to receive the lower edge 40 of the edging 14. A single registration pin 42 is disposed in the lower groove 38 transversely thereof, and is preferably located at the center of the longitudinal length of the anchor clamp 16. The registration pin 42 is preferably tapered pin which is secured by a force fit in a hole 44 bored in the anchor clamp (see FIGS. 4 and 5). The registration pin 42 is adapted to mate with a groove 46 formed in the lower edge 40 of the edging when the edging is in a predetermined longitudinal position in the lower groove 38 of the anchor clamp 16. Thus, when the edging 14 is inserted into locking engagement with the anchor clamp 16, the rubber blanket 10 is axially registered with respect to the offset cylinder 12.

A plurality of elastomeric elements 48 are disposed in the lower groove 38 of the anchor clamp 16, the elas-
omeric elements being adapted to bias the retaining rib 34 of the edging 14 into engagement with the upper groove 32 of the anchor clamp 16 (see FIG. 5). The elastomeric elements are preferably made of a material such as rubber, although one or more flat or coil springs could be used if desired. There are preferably three elastomeric elements 48, an elastomeric element being located at each end of the anchor clamp and the third one being disposed generally at the center thereof (see FIG. 3).

The anchor clamp 16 is bored with a hole 50 near each end thereof to accommodate the screws 18 and 24 by means of which the clamp is secured to the cylinder 12 or the reel rod 22. If desired, one or more additional holes 50 may be provided in the clamp.

FIGS. 4 and 5 show how the edging 14 may be rapidly inserted into, or withdrawn from, locking engagement with the anchor clamp 16, the registration pin 42 cooperating with the registration groove 46 of the edging to insure that the edging is longitudinally registered when it is anchored by the anchor clamp. Thus, unless the registration pin and the registration groove are aligned, the lower edge 40 of the edging cannot be inserted sufficiently far into the lower groove 38 of the clamp to permit the retaining rib 34 of the edging to clear the upper retaining rib 32 of the anchor clamp. When the registration pin and the registration groove are properly aligned, the edging is forced into the lower groove 38 against the biasing action of the elastomeric elements 48, and then the edging is pushed completely through the opening 30 of the anchor clamp and released. (The edging 14 is provided with a longitudinal groove 54 to enable the edging to clear the lower retaining rib 56 of the anchor clamp.) The elastomeric elements 48 then drive the retaining rib 34 of the edging into locking engagement with the upper groove 32, so that the edging is securely held by the anchor clamp.

The blanket 10 may then be wrapped around the off-set cylinder and tightened by the reel rod 22, and during this operation the edging will not slide in, or become disengaged from, the anchor clamp, due to the biasing action of the elastomeric elements 48 and to the registration provided by the registration pin 42 in cooperation with the registration groove 46. When the edging 14 is anchored by the clamp 16 and tension is put on the blanket 10, the retaining rib 34 of the edging is pulled into engagement with the upper groove 32 of the anchor clamp, and the lower portion of the edging is prevented from being pulled out of the lower groove 38 by the lower retaining rib 56 of the anchor clamp.

FIG. 6 shows how the edging 14 is secured to the edge of the rubber blanket 10. The rubber blanket 10 comprises a heavy cotton backing 60 coated with rubber, and preferably comprises 3 or 4 plies of alternating layers of fabric and rubber, although only one ply is shown in the drawings for simplicity. The edging is preferably a channel of anodized extruded aluminum or steel, for example, and is generally U-shaped in cross section. One side 62 of the edging is thicker than the other side 64, and the side 62 is thicker at its outer end forming the retaining rib 34 than at its end adjacent the interior bottom surface 66 of the blanket-receiving cavity of the edging. The interior bottom surface 66 of the cavity has a width at least that of the thickness of the edge of the blanket 10.

The interior surface of the side 62 is provided with a plurality of pointed ridges 68 which are adapted to bite into, but not through, the fabric 60 to grip the blanket 10 securely. The interior surface of the side 62 is formed by recesses 70 and an outer groove 72 for purposes to be discussed hereinafter. Similarly, the interior surface of the side 64 is provided with a plurality of pointed ridges 74 and recesses 76, the ridges 74 being disposed out of register with the ridges 68. Also, a sharp longitudinal ridge 78 extends inwardly at the outer edge of the side 64.

In order to secure the edge of the blanket 10 to the edging 14, the side 64 is first bent outwardly to the position shown in phantom at 64' in FIG. 6. Then the interior surfaces of the sides 62 and 64 are coated with an adhesive or a cement 80, and the cement is also applied to the fabric 60 along the edge of the blanket. The cemented edging is then slipped over the edge of the blanket 10, so that the side 62 is adjacent the fabric 60. The assembly is placed in a press and the side 64 is pressed to the position shown in full in FIG. 6, so that the outer surface of the side 64 is parallel with the outer surface of the side 62 and the interior surfaces of the two sides are also generally parallel.

The overflow groove 72 formed in the interior surface of the side 62 adjacent the outer edge thereof carries off any excess cement resulting when the side 64 is pressed to its final position, thereby preventing the cement from reaching the fabric 60 outside of the edging 14. Similarly, the sharp longitudinal ridge 78 extending inwardly at the outer edge of the side 64 prevents the escape of any excess cement from the space between the side 64 and adjacent surface of the blanket 10. If cement were to harden on the fabric or the opposite side of the blanket outside of the edging, it might prevent the blanket from being laid evently across the teeth 36 and might result in unequal tension being applied along the blanket.

When it is desired to bond the blanket to the edging, it also forms hardened cement projections which are received in the recesses 70 and 76. Accordingly, the blanket 10 is gripped by the anchor clamp 16 directly by the teeth 36 thereof. In addition, the blanket is gripped by the edging 14 by means of the sharp ridges 74 and 78 which bite into the blanket, and because of the hardened cement projections bonded to the blanket which engage the recesses 70 and 76 of the edging. Additional gripping is provided by the cement bond between the interior surfaces of the sides 62 and 64 and the adjacent surfaces of the blanket. Various substitutions, changes and modifications in the form and details of the apparatus illustrated may be made. For example, the upper abutting surface of the edging and the upper groove 32 of the anchor clamp could be formed in the sloped configuration disclosed in the above-mentioned Patent No. 2,923,245. Furthermore, the edging and anchoring apparatus of the present invention could also be used to secure flexible metallic printing plates used in planographic, gravure and flexographic processes, appropriate modifications being made in the interior side surfaces of the edging, if necessary, to provide a secure bond between the edging and the metallic plate.

1. Apparatus for anchoring the edge of a printing blanket comprising:
   a channel member having an opening through which the edging is adapted to be inserted and withdrawn, the channel member being formed with an upper groove and a lower groove, the upper groove being shaped to receive the upper abutting surface of the edging, and
   means disposed in the lower groove for biasing the upper abutting surface of the edging into engagement with the upper groove.

2. Apparatus according to claim 1 wherein the biasing means includes at least one elastomeric element mounted in the lower groove.

3. Apparatus according to claim 1 wherein the channel member mounts means for positioning the edging longitudinally in the upper and lower grooves.

4. Apparatus according to claim 3 wherein the positioning means includes a registration pin disposed in and transversely of the lower groove, the registration pin being adapted to mate with a corresponding groove formed in the lower edge of the edging when the edging is in a predetermined longitudinal position in the lower groove of the channel member.
5. Apparatus according to claim 1 wherein a plurality of teeth project from the exterior upper surface of the channel member, the teeth being adapted to bite into but not through the printing blanket.

6. Apparatus according to claim 5 wherein the teeth include a plurality of spaced pointed ridges extending in substantially parallel relation with the upper groove of the channel member.

7. Apparatus according to claim 1 wherein the edging is generally U-shaped and has a plurality of pointed ridges projecting from at least one of the interior side surfaces thereof, the pointed ridges being adapted to bite into but not through the printing blanket.

8. Apparatus according to claim 7 wherein at least one recess is formed in at least one of the interior side surfaces, and a projection of hardened cement is bonded to the printing blanket surface and extends into the recess, whereby the pointed ridges of the edging grip the printing blanket and the cement projection bonded to the printing blanket enganges the recess of the edging to anchor the edge of the printing blanket.

9. Apparatus for anchoring the edge of a printing blanket comprising:

(a) a generally U-shaped edging having a plurality of pointed ridges projecting from at least one of the interior side surfaces thereof, the pointed ridges being adapted to bite into but not through the printing blanket, one of the sides of the edging having an upper abutting surface,

(b) a channel member having an opening through which the edging is adapted to be inserted and withdrawn, the channel member being formed with an upper groove and a lower groove, the upper groove being shaped to receive the upper abutting surface of the edging,

(c) means mounted on the channel member for positioning the edging longitudinally in the upper and lower grooves, and

(d) means disposed in the lower groove for biasing the upper abutting surface of the edging into engagement with the upper groove.

10. Apparatus for anchoring the edging on the edge of a printing blanket comprising:

(a) a channel member formed with an interior upper abutting surface and a lower groove, the interior upper abutting surface being shaped to receive the upper abutting surface of the edging, the lower groove being formed by a retaining rib, the retaining rib being spaced from the interior upper abutting surface forming portion of the channel member to define an opening through which the edging is adapted to be inserted and withdrawn, the retaining rib being disposed so as to retain the lower portion of the edging in the lower groove when the edging is inserted through the opening and the upper abutting surface of the edging engages the interior upper abutting surface of the channel member, and

(b) means disposed in the lower groove for engaging the lower groove forming portion of the channel member and the lower edge of the edging to drive the upper abutting surface of the edging against the interior upper abutting surface of the channel member.

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