

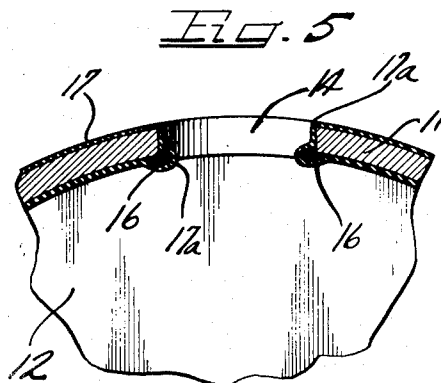
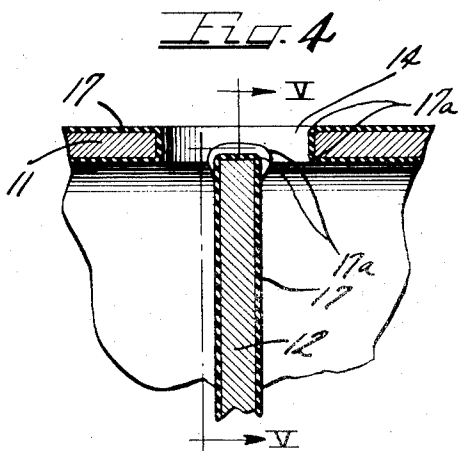
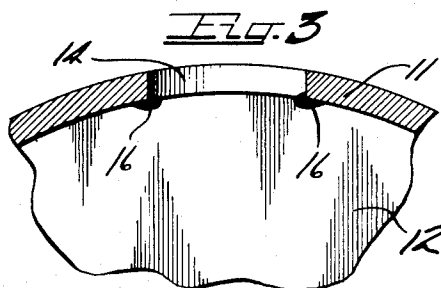
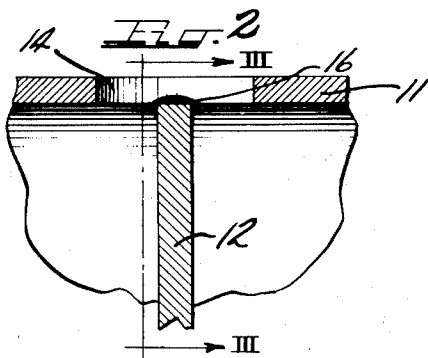
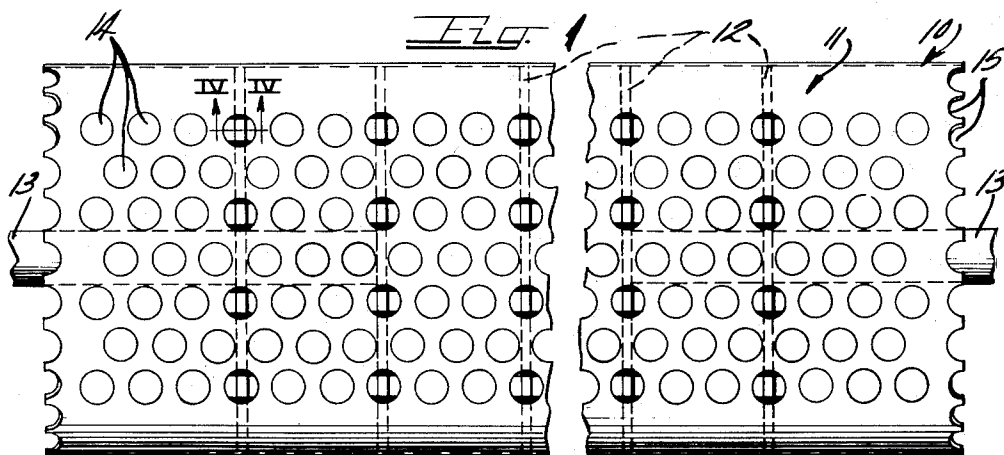
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PAPERMAKING MACHINE RECTIFIER ROLL

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## UNITED STATES PATENT OFFICE

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## PAPERMAKING MACHINE RECTIFIER ROLL

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This invention relates to a perforated or foraminous roll construction free from burs and sharp corners and produced without the aid of expensive finishing operations. Specifically the invention deals with a paper machine rectifier roll construction and a method of making rectifier rolls wherein a perforated tube has axle supporting disks tack welded therein at the points where they cross the perforations and wherein all burns, sharp corners, and the like, are covered with smooth rubber fillets obtained by dipping the entire fabricated assembly in rubber latex or the like.

Heretofore rectifier rolls were equipped with expensive end head constructions for carrying the roll supporting axles. If baffles were desired in the roll between the end heads, the same were secured to the tubular portions of the roll by means of pins or the like. In such prior known rectifier roll constructions the holes were carefully reamed and smoothed off to eliminate burs and sharp corners. Such finishing operations were time consuming and expensive.

The present invention now provides a rectifier roll construction free from the heretofore used end heads. The roll of this invention includes a metal tube having perforations around the entire periphery thereof and along the entire length thereof. A plurality of metal disks traverse the interior of the tube in spaced parallel relation. The outermost disks are spaced inwardly from the ends of the tube and the axles are carried by these outermost disks. The disks bridge some of the holes in the tube and are tack welded to the tube at these points. The tube with the disks welded therein is then subjected to a plurality of successive latex dipping and vulcanizing operations until a coating of rubber of predetermined thickness covers every bit of exposed metal surface. The rubber coating forms smooth fillets around all sharp corners and covers any irregular or sharp burs that might be present on the metal parts. The rubber cover eliminates the necessity for finishing operations and materially lessens the cost of the roll. Since the tube is perforated, the interior of the roll is rubber coated with the exterior. The wall defining each hole in the roll is likewise covered with a rubber layer and therefore each hole has a smooth periphery. As a result of this construction pockets capable of collecting filling material, such as clay or the like, in the paper stock in which the roll operates, are eliminated.

It is then an object of this invention to provide an inexpensive perforated roll construction suit-

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able for use in paper making machinery to operate in paper stock.

A further object of the invention is to provide a paper machine rectifier roll construction without the necessity for expensive metal finishing operations.

A still further object of the invention is to decrease the production cost of paper machine rectifier rolls.

Another object of the invention is to provide a rubber or plastic covered metal rectifier roll for paper making machinery.

A still further object of the invention is to provide a roll construction composed of a perforated tube and having disks traversing the interior of the tube and bridging some of the holes therein, together with tack weld bonds at said hole areas for uniting the disks and tube.

Other and further objects of the invention will be apparent to those skilled in the art from the following detailed description of the annexed sheet of drawings which, by way of a preferred example only, illustrates one embodiment of the invention.

On the drawings:

Figure 1 is a broken fragmentary elevational view of a rectifier roll construction according to this invention.

Figure 2 is an enlarged fragmentary longitudinal cross sectional view taken through one of the holes of the roll of Fig. 1 and illustrating the construction at this point before the same is covered with rubber.

Figure 3 is a transverse cross sectional view, with parts in elevation, taken along the line III—III of Fig. 2.

Figure 4 is an enlarged fragmentary longitudinal cross sectional view taken along the line IV—IV of Fig. 1.

Figure 5 is a transverse cross sectional view taken along the line V—V of Fig. 4.

As shown on the drawings:

The rectifier roll 10 shown in Fig. 1 is composed of a perforated metal tube 11, a plurality of transverse metal disks 12 in the tube 11 and roll supporting axles 13 carried at the axial center of the tube and projecting from the ends thereof. The outermost metal disks 12 are spaced inwardly from the end edges of the tube and several of the outermost disks have the inner ends of the axles 13 affixed thereto as by welding or the like. Thus each outermost disk 12 can have an aperture through its axial center receiving the axle therethrough. The inner end of the axle can then be bottomed on the next ad-

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jacent disk and the axle is then welded to both disks.

The tube 11 has circular perforations 14 there-through around the entire periphery thereof and along the entire length thereof. The end edges of the tube have semi-perforations 15 therein providing scalloped edges on the tube. The holes or apertures 14, as shown, are arranged in radially aligned rings and in longitudinally aligned rows so that a metal disk 12 can be positioned in the tube to bridge all of the holes of one ring as shown. It will be understood, however, that this radial ring arrangement of holes is not necessary since the tube has a sufficient number of apertures so that a disk traversing the interior of the tube would bridge a number of the apertures.

The disks 12 are in spaced parallel relation and provide baffles which define in the tube isolated parallel flow paths. Since in a rectifier roll construction paper stock must flow through the roll, these isolated paths in the roll will stop transverse stock currents.

As shown in Figs. 2 and 3, the disks 12 fit rather snugly in the tube 11 and bisect some of the holes 14. Portions of the periphery of the disks 12 are thus exposed in the holes 14.

According to this invention as shown in Figures 1, 2, and 4 the disks 12 are thinner than the diameter of the holes 14 and are integrally affixed to the tube 11 by tack welds 16 (Figures 2, 3, and 5) at the areas where the periphery of the disk emerges from covered relation by the tube. Thus the peripheral margin of the disk is tack welded to the tube at two areas in each hole bridged or bisected by the disk. These weld bonds 16 are conveniently made through the holes 14 since a welding tool can be operated through the hole 14 to extend the bond around the peripheral margin of the disk as shown in Fig. 2 and also under the peripheral margin of the hole 14 as shown in Fig. 3. The tack weld bonds 16 therefore do not materially restrict the holes 14.

Since the tube and disks may have relatively sharp unfinished edges and since the tack weld bonds 16 may contain irregular surfaces and bur-like edges, according to this invention, a smooth roll construction is obtained by merely dipping the entire welded assembly into a latex bath to deposit a skin of latex thereon. This skin is then vulcanized and the dipping and vulcanizing operations are repeated until a coating of the desired thickness is built up on all metal surfaces of the roll. A film of about .008 inch in thickness is obtainable for each dip and the dipping and vulcanizing operations are repeated until a coating of about  $\frac{1}{16}$  of an inch in thickness is obtained. Instead of rubber latex, other plastic compositions may be used with the same results.

As illustrated in Figs. 4 and 5, a rubber coating 17 covers all of the metal surfaces including the inner and outer faces of the tube 11, the walls defining the holes 14, both faces of the disks 12, the exposed peripheral portions of the disks 12, and the weld bonds 16. This coating 17 upon vulcanization or drying draws around all sharp corners to form rounded filleted edges such as 17a. These edges will not retain clays, fibers, or the like, in the stock flowing through the roll during its use in a paper making machine. As a result of this construction the rolls are easily kept in clean condition.

From the above description it should be understood that this invention provides an efficiently operating inexpensive rectifier roll con-

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struction wherein heretofore necessary finish machining operations are eliminated. The roll of this invention is coated with rubber, plastic, or the like, non-corrodible material. The metal parts of the roll can therefore be composed of inexpensive base metal. The metal parts need not have accurate interfitting relation since the rubber or plastic coating will fill out all voids and cover all irregular surfaces. Stocks or filler material retaining pockets are entirely eliminated.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. A paper-making machine rectifier roll comprising a perforated metal tube, a plurality of transverse metal disks in spaced parallel relation in said tube, said disks having peripheral portions bridging some of the perforations in the tube, said portions having thickness less than the diameter of the perforations, weld bonds uniting the disks and tube at the areas where the peripheries of the disks emerge from a covered relation by the tube in the perforations of the tube without closing the perforations, and a non-corrosive plastic material covering and bonded to said tube, disks and weld bonds and having smooth fillet portions covering all sharp edges and irregular metal surfaces.

2. A rectifier roll for paper making machinery which comprises a metal tube, a plurality of metal disks in said tube normal to the axis of the tube, said tube having holes around the periphery thereof of larger diameter than the thickness of the disks for exposing portions of the periphery of said disks, localized weld bonds in said holes affixing the disks to the tube without closing the holes, and a coating of non-corrodible plastic material integrally bonded to all exposed metal surfaces, said coating forming smooth fillets over all sharp corners and irregular metal surfaces.

3. A paper-making machine rectifier roll comprising a metal tube, said tube having holes therethrough extending completely around the periphery thereof and along the entire length thereof, a plurality of relatively thin metal disks traversing the interior of said tube in spaced parallel relation, the outermost disks being spaced inwardly from the end edges of the tube, each of said disks having exposed peripheral and side face portions in a plurality of holes in the tube, localized weld bonds uniting said exposed peripheral portions to the tube without closing the holes, axles projecting into the ends of the tube and anchored in the outermost disks, and a non-corrodible plastic coating covering all exposed surfaces of the metal tube, the metal disks and the weld bonds, said coating being sufficiently thick to form smooth fillets covering all sharp corners and irregular metal surfaces.

4. A paper making machine rectifier roll comprising a cylindrical metal tube having open ends, said tube having surface perforations formed by a plurality of axially spaced peripherally aligned series of apertures, the tube having scalloped open edges formed by those apertures adjacent the edges, circular metal disks in said tube inwardly from the scalloped edges thereof, axles carried by said disks, each of the disks being aligned with a peripherally aligned

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series of apertures in the tube, tack welds uniting the disks to the tube at the apertures, and a rubber latex coating covering all of the metal surfaces of the tube, the disks, and the tack welds, said rubber latex coating being sufficiently thick to provide rounded fillets over all irregular or sharp metal surfaces, while leaving the apertures open to facilitate rectifying action of the roll.

EDWARD D. BEACHLER. 10

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