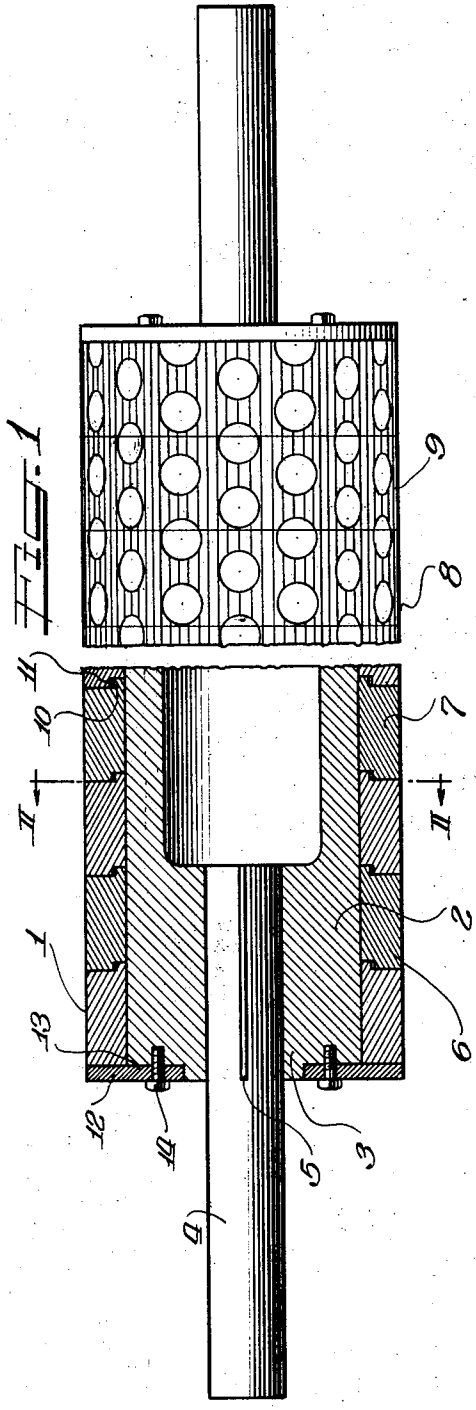
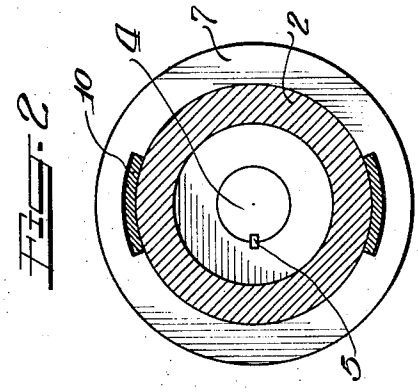
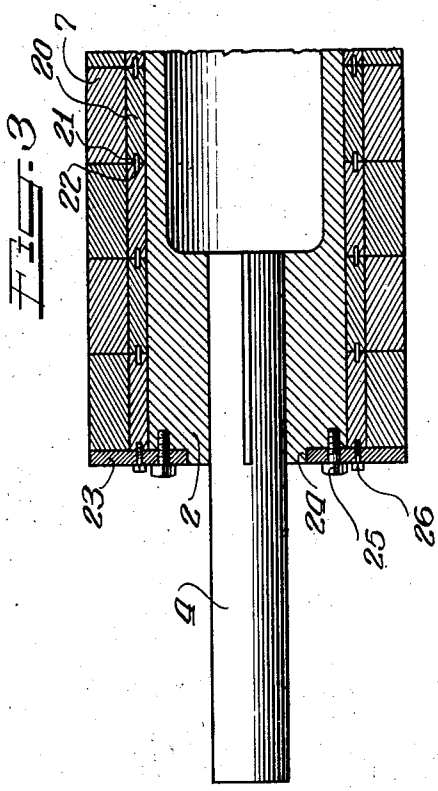
Oct. 18, 1932. H. G. WEBER 1,883,184

MARKING ROLL WITH HARD RUBBER SURFACE

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MARKING ROLL WITH HARD RUBBER SURFACE

Application filed July 28, 1930. Serial No. 471,203.

This invention relates to a marking device and more particularly to such a device having special utility in a paper making machine for imparting watermarks or similar designs to the paper or other fibrous web as it moves through the machine.

Various grades and qualities of paper are required in the industry and, accordingly, it is advisable to mark the paper to indicate the quality thereof and the company by which it is manufactured. This result is generally accomplished by means of rolls having surfaces with designs thereon which are impressed on the paper web, in present practice, usually after it leaves the forming part of the machine and before it reaches the calender rolls.

As will be appreciated, designs on such surfaces wear out after a time, or in some instances, it may be desired to change the grade of paper made in the machine, in which event it becomes necessary to remove the marking roll. If the marking faces of the rolls are worn out, the rolls are usually dismantled and new or renewed marking faces are applied thereto, as required by economical practice.

Marking rolls heretofore generally employed for this purpose comprise either the stereotype form in which stereotype marking plates are rigidly secured to a supporting roll or shaft, or the engraved rubber form. In the latter type, marking faces of hard gum are secured to the supporting roll by a layer of soft endless rubber bands in turn secured to the shaft, or by intermediate layers of soft and hard rubber vulcanized together and fixed to the supporting roll or shaft.

The stereotype form of marking roll, when forced against the fibrous web, produces a tendency for the type to cut therethrough and, hence, it is necessary to dull the faces of the type by wrapping the roll with one or a number of layers of fabric. This material, however, readily wears out and must be replaced by new wrappings, all of which involves labor, time and expense. In addition, when the stereotypes wear out or the quality of paper produced by the machine is changed, considerable time and difficulty is experienced in replacing the rolls in the machine by other rolls, dismantling the rolls if worn, and in renewing and reconstructing the rolls. Similar problems are presented in the engraved gum surface rolls especially in regard to the removal and replacement of work marking surfaces.

I have now constructed a marking roll which is singularly free from the above objections in that it has a rather low initial cost, has a readily removable marking surface permitting it to be quickly constructed and dismantled, and a low operating cost.

It is, accordingly, an object of this invention to provide a roll for watermarking paper which has a readily removable and renewable marking surface.

It is a further important object of this invention to provide a watermarking roll with a marking surface which is sufficiently hard to impart a clear impression in the paper web yet sufficiently resilient as to obviate the necessity of wrapping the marking surface thereof to prevent its cutting into the paper web.

It is a further important object of this invention to provide a marking roll which has a relatively low initial and operating cost and is highly efficient in watermarking paper during its formation on any type of paper machine.

Other and further important objects of this invention will become apparent from the following description and appended claims.

Referring now to the drawing which discloses a preferred embodiment of my invention:

Figure 1 is a front elevational view of a marking roll of this invention, with parts broken away and parts in section;

Figure 2 is a sectional view on line II—II of Figure 1;

Figure 3 is a view similar to Figure 1 showing a modified form of marking roll.

On the drawing:

The marking roll of Figure 1, indicated as a whole by the reference numeral 1, comprises a hollow metallic supporting core 2 having at each end 3 pressed in journal extensions 4.

Said journal extensions 4 are positively retained in the ends of said core by means of keys or splines 5.

The marking surface 6 of the roll 1 is formed by a plurality of abutting rubber sleeves 7, fitting about the periphery of said core. Said sleeves 7 have an inner diameter such as to permit their being forced over the ends of the core 2 and to provide for a snug fit about the core. However, if desired, said sleeves may be cemented to the periphery of the core 2, although, this construction retards the rate of removal of the sleeves from the core and, is therefore, not to be preferred.

The size of the sleeves 7 may vary if desired, but good results are secured with sleeves having a width of from about 16 to 20″ and a wall thickness of about 2 to 3″.

The rubber employed in forming the marking sleeves 7 is such that the marking sleeves are sufficiently hard to impart a clear impression in the paper web, yet sufficiently resilient to cushion the marking surfaces of the sleeves from the core 2, thereby obviating the necessity of providing other cushioning means between the said core 2 and the marking sleeve 7 or providing protective wrappings for the marking surfaces of said sleeves. Moreover, the surfaces of the rubber sleeves may be readily engraved with the desired design or designs. The rubber is preferably such as has a penetration of from 5 to 20 units on the plastometer scale (Pussey and Jones Plastometer).

The outer surface of each marking sleeve 7 carries an etched or engraved design 8 either complete in itself or forming part of a single design 9 of the entire marking surface of the roll. In either event, in order that the required design be properly impressed on the paper or other fibrous web, it is necessary that said sleeves 7 be properly adjusted with relation to each other and securely retained in such adjusted relationship. This result is accomplished by forming abutting ends of the marking sleeves 7 with cooperating male and female parts 10 and 11 respectively, each sleeve being formed at one end with a plurality of male members 10 and at the opposite end with female parts 11. When the sleeves 7 are placed on the core 2, the male members 10 on one end of a sleeve are received in the female parts 11 in an end of an adjacent sleeve, thereby effectively preventing relative rotation between said sleeves.

The sleeves 7 are retained on the core 2 by means of metallic rings 12 which are situated in recesses 13 provided in the ends 3 of the core, so as to bear against the outermost of the rubber sleeves 7. Said rings are detachably secured to the core 2 by means of screws 14 threaded into the ends of said core.

It will thus be readily appreciated that in this type of roll, the roll marking surface may be quickly and easily mounted on and removed from the core 2 when it is desired to change the marking surface of the roll. Furthermore, that the initial and upkeep cost of the roll is small as compared to present day marking rolls.

In Figure 3, I have disclosed a modified form of marking roll in which the rubber marking sleeves 7 are mounted on steel sleeves 20 snugly mounted on the periphery of the core 2. The rubber marking sleeves 7 may be cemented to said steel sleeves 20 or may be formed to snugly fit thereabout without the provision of a fastening medium.

Relative rotation between the steel sleeves 20 is prevented by means of small pins 21 situated in cooperating slots 22 formed in the abutting ends of adjacent sleeves.

Male and female members 10 and 11, such as described in connection with the sleeves 7 of Figure 1 are also provided on the rubber marking sleeves of Figure 3 in order to retain said sleeves in adjusted relationship upon the steel sleeves 20. These elements may, however, be dispensed with if the rubber marking sleeves 7 are cemented or otherwise secured to said steel sleeves 20.

While I have disclosed a single marking sleeve 7 mounted on a steel sleeve 20, it is to be understood that this is not a structural limitation, as a plurality of marking sleeves 7 may be mounted on a single steel sleeve 20 and conversely, a single marking sleeve may be mounted upon a plurality of said steel sleeves 20. Furthermore, it is not necessary that the marking sleeves cover the entire periphery of the roll as they may be located upon the roll at any point desired.

The steel sleeves 20 permit the use of rubber sleeves of less thickness than if said sleeves 20 were omitted, thereby effecting a saving in rubber. Rubber sleeves of a thickness of about 2 inches function effectively in this type roll, although, of course, this thickness may be varied if desired. In addition, the steel sleeves 20 permit changing of the marking surface of the roll more quickly than when the rubber marking sleeves are mounted directly upon the core 2.

The rubber marking sleeves 7 and the steel sleeves 20 are retained upon the core 2 by means of metallic rings 23, similar to those described in connection with Figure 1, mounted in recesses 24 in the ends of core 2 so as to bear against the outermost of the rubber sleeves 7 and the steel sleeves 20. Said rings 23 are secured to the core 2 by means of the screws 25 and to the outermost steel sleeves by the screws 26.

While I have disclosed a preferred embodiment of my invention, it will be understood that I do not propose to be limited thereto as various changes may be made in the details of my structure without departing from the spirit of the invention disclosed.

I claim as my invention:

1. A device for impressing a watermark in a fibrous web during the course of its formation, comprising a supporting shaft, a plurality of engraved rubber sleeves snugly fitting about said shaft, the density of the rubber of said sleeves being such as to render the sleeves hard enough to watermark the fibrous web, yet sufficiently resilient to cushion the impact of the sleeves against the web to thereby prevent cutting of the web, the abutting ends of adjacent sleeves having cooperating male and female members for preventing relative rotation between said sleeves.

2. A watermarking roll for impressing a design on a fibrous web during the course of its formation, comprising a supporting shaft, a plurality of engraved rubber sleeves snugly fitting about said shaft, the rubber of said sleeves having a density of about 5 to 20 units on the plastometer scale, and co-operating male and female members formed on the abutting ends of adjacent sleeves for preventing relative rotation between said sleeves.

3. A device for watermarking a fibrous web during the course of its formation, comprising a supporting shaft, a plurality of engraved rubber sleeves snugly fitting about said shaft, the density of the rubber of said sleeves being about 5 to 20 units on the plastometer scale, each abutting sleeve having about the periphery of one of its ends a plurality of projections and about the periphery of its other end a plurality of recesses, the projections on the end of one sleeve fitting into the recesses in an abutting sleeve to prevent relative rotation between said sleeves, and means for detachably securing said sleeves on said shaft.

4. A watermarking roll, comprising a supporting shaft, a plurality of detachable rubber sleeves having engraved surfaces and of such diameter as to snugly fit about the periphery of said shaft, the rubber of said sleeves having a penetration of about 5 to 20 units on the plastometer scale, means for preventing relative rotation between said sleeves, and rings detachably secured to the ends of said shaft for retaining said sleeves on said shaft.

5. A watermarking roll, comprising a shaft, a plurality of metallic sleeves snugly fitting about said shaft, and a plurality of engraved rubber sleeves on said metallic sleeves of such diameter as to snugly fit about said metallic sleeves, the thickness and hardness of the rubber of said engraved sleeves being such as to render the sleeves hard enough to watermark the fibrous web, yet sufficiently resilient to cushion the impact of the sleeves against the web to thereby prevent said sleeves cutting into the web, and means for detachably retaining said steel sleeves and said rubber sleeves on said core.

6. A watermarking roll for impressing a design in a fibrous web during the course of its formation, comprising a shaft, a plurality of metallic sleeves snugly fitting about said shaft, means for preventing relative rotation between said sleeves, a plurality of detachable marking sleeves of rubber about said metallic sleeves and of such diameter as to snugly fit about said sleeves, the hardness of the rubber of said sleeves being such as to render the sleeves hard enough to watermark the fibrous web, yet sufficiently resilient to cushion the impact of the sleeves against the web to thereby prevent the sleeves cutting into the web, means for preventing relative rotation between said rubber sleeves, and means for detachably retaining said steel sleeves and said rubber sleeves on said shaft.

7. A device as in claim 6 wherein the hardness of the rubber of the marking sleeves is between 5 and 20 units on the plastometer scale.

8. A device for impressing a design in a fibrous web during the course of its formation comprising a supporting shaft and a plurality of interlocked engraved rubber sleeves snugly fitting about said shaft.

9. Means for impressing a design in a fibrous web during the course of its formation, said means comprising a supporting shaft, and an engraved impressing member formed of a sleeve of a single thickness of rubber snugly fitting about said shaft, the rubber of said sleeve having a penetration of about 5 to 20 units in the plastometer scale.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

HERMAN G. WEBER.