Jan. 14, 1936. G. VON WEBERN 2,027,407

APPARATUS FOR CLEANING ROLLS

Filed Feb. 9, 1934 2 Sheets-Sheet 1

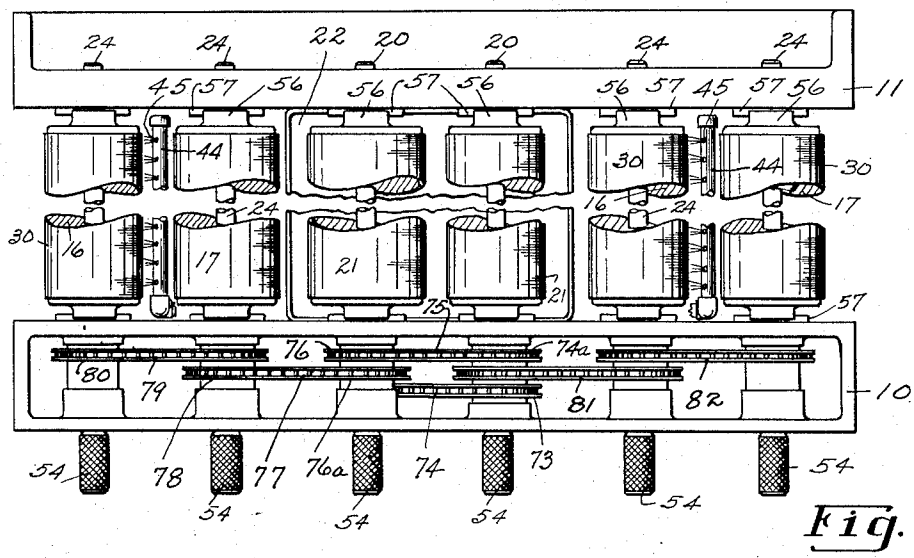


Fig. 2

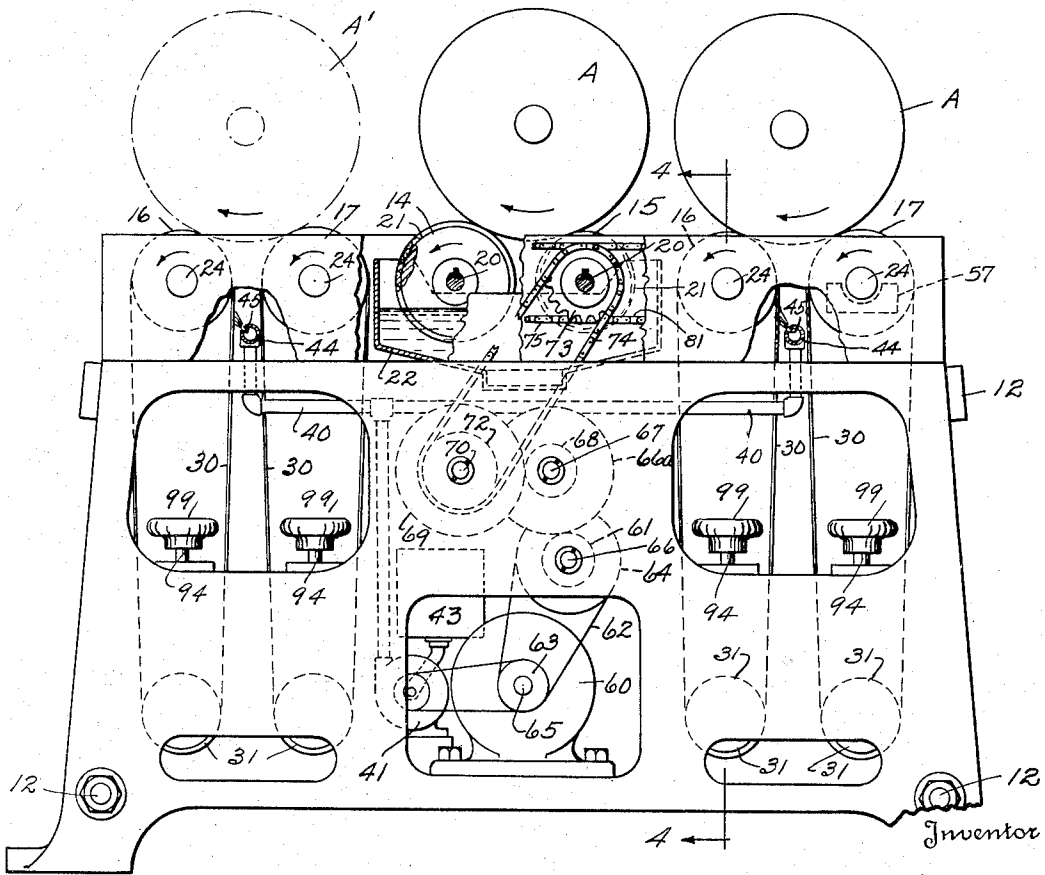


Fig. 1

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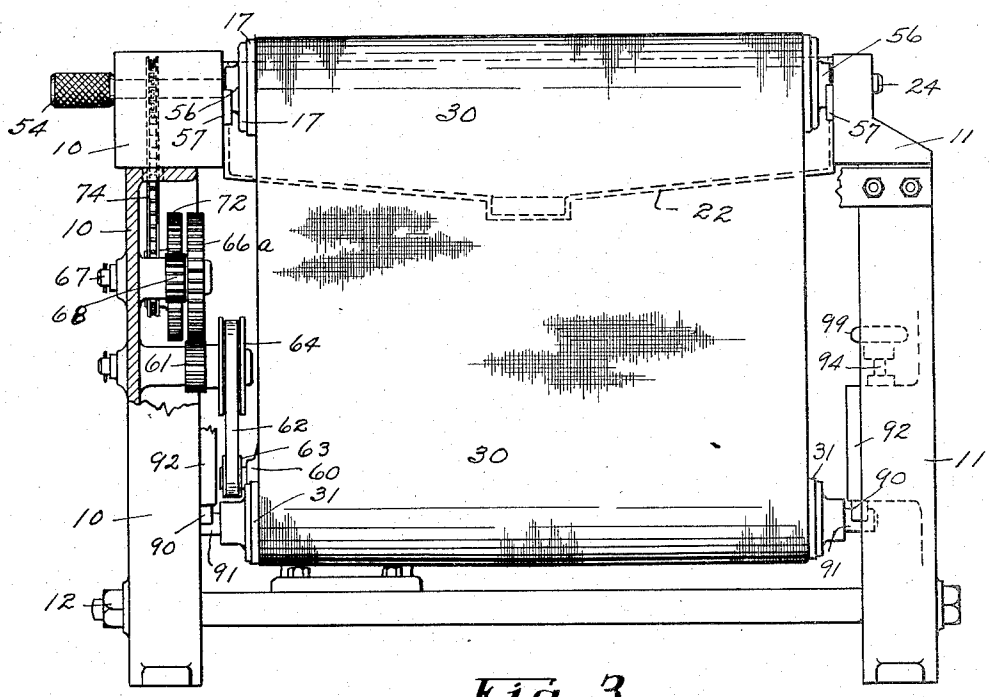


Fig. 3

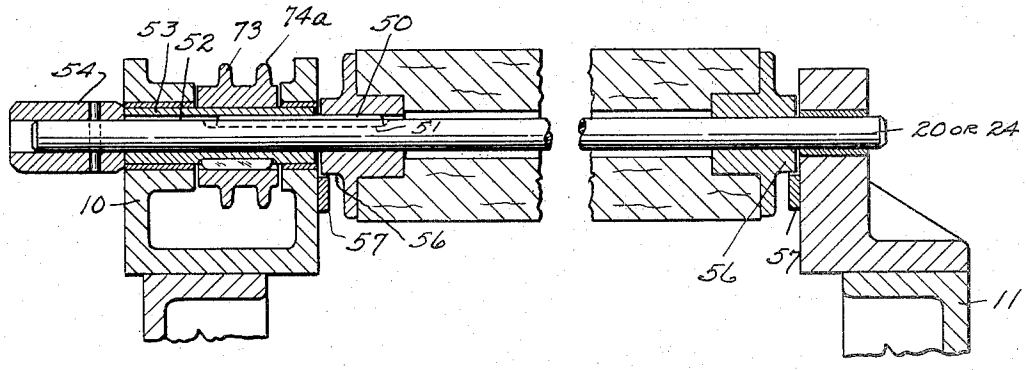
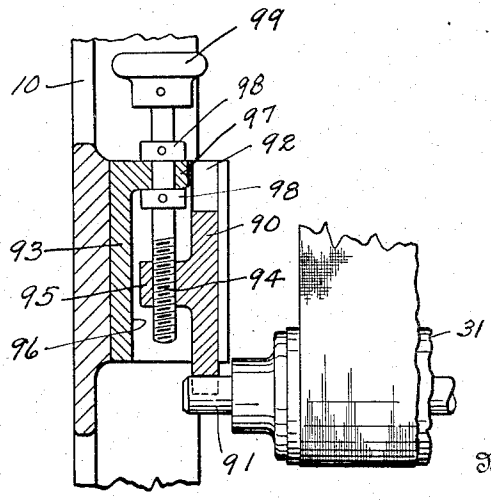


Fig. 4



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UNITED STATES PATENT OFFICE

2,027,407

APPARATUS FOR CLEANING ROLLS

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Application February 9, 1934, Serial No. 710,518

2 Claims. (Cl. 15—4)

This invention relates to an apparatus for cleaning the surface of large composition rolls and the like, and particularly to an apparatus for cleaning offset rolls used for decorating materials such as are commonly used in graining processes.

Composition rolls used in wood, marble and other graining methods are usually formed with a hard core and a tacky, resilient outer layer of composition material, the major components of which may be materials such as glue and glycerine. A well known method of graining or decorating surfaces is to remove ink or pigment from a printing plate, having a design thereon, by moving an offset or composition roll first, into rolling contact with the plate, and then into rolling contact with the subject to be decorated, causing the pigment material which adheres to the composition roll to be impressed onto the subject. While the greater portion of the ink, conveyed to the offset or composition roll from the printing plate, is transferred from the composition roll to the subject, nevertheless a certain amount of ink remains on the roll after such transfer. Hence, such roll is cleaned before it is again brought into contact with the pattern to receive ink or pigment for another impression.

The cleaning method usually followed consists in rotating the composition roll against the relatively stationary scraper blade, which scrapes the ink or pigment from the roll. However, it has been found difficult to maintain such action between the scraper blade and the roll, as is required to effectively remove the ink without damage to the surface of the roll. This is due in some instances to the weight and resiliency of the composition roll and the attendant difficulty of properly supporting it for fine adjustment relative to the scraper.

In many instances, the composition or offset roll is manually rolled across the pattern or plate and subsequently is manually rolled over a piece of work. The operator then carries the roll to a roll cleaner. As the operation is manual, the interval of time between the application of pigment or ink to the composition roll and the actual cleaning of the roll varies considerably and at times the length of this interval is such that the ink or pigment dries to such an extent that it becomes difficult and at times impossible for a scraper blade to remove the material or pigment from the roll without damage to the surface thereof.

The general object of the present invention is to overcome the difficulties above mentioned, and I propose to accomplish this by providing a cleaning apparatus, which will clean the roll without the aid of a scraper, and which apparatus will be arranged to remove pigment or ink from the roll even though such pigment or ink has partially dried thereon in a rapid and efficient manner.

A further object of my invention is to provide an apparatus for cleaning of composition rolls and the like, which apparatus will avoid the liability of damage to the rolls by applying a liquid solvent to the roll to be cleaned during the cleaning operation.

Other objects and features of the invention will become apparent from the following description, reference being had to the accompanying drawings which illustrate a preferred embodiment of the invention. The essential characteristics will be summarized in the claims.

In the drawings, Fig. 1 is a side elevation of my improved apparatus partially broken away to more clearly indicate the internal construction thereof; Fig. 2 is a plan view of my apparatus, partially broken away, for ease of illustration; Fig. 3 is an end view of the apparatus looking towards the right hand end of Fig. 1, certain parts being broken away to more clearly illustrate the internal construction; Fig. 4 is a fragmentary sectional view, as indicated by the line 4—4 on Fig. 1.

In general, my improved roll cleaning apparatus comprises a pair of upstanding frame members 10 and 11, spaced apart by suitable transverse frame members 12. Adjacent the upper portion of the frame members are a pair of cleaning rollers 14 and 15, which are spaced apart from each other and arranged to support the printing roll to be cleaned. The rolls 14 and 15 rotate in a bath of pigment solvent, which is applied to the roll and cleans it, as will be hereinafter more fully described. After the roll is cleaned by the rollers 14 and 15, it is transferred to a second pair of rollers 16 and 17, which carry liquid absorbent belts 30, and which act to remove any solvent or pigment remaining on the roll.

The rollers 14 and 15 are drivingly secured to respective shafts 20, which are journalled in the frame members 10 and 11, as will hereinafter be more fully described. The rolls are preferably formed of wood and are provided with a fabric covering 21. The rollers 14 and 15 rotate with their lower areas submerged in a pigment solvent which is carried in a suitable trough or pan 22 mounted on the frame members 10 and 11 and disposed beneath the rollers 14 and 15, to supply the fabric covering of the rollers with liquid

solvent, and to recover any solvent which may drain from the rollers.

The roll to be cleansed is indicated at "A" in Fig. 1, and is there shown as freely resting on the rollers 14 and 15. Hence, the rotation of the rollers will rotate the roll A. A slight scrubbing action is procured between the rollers 14 and 15 and the roll A, due to a difference in peripheral speed between the two rollers. As will be hereinafter more fully described, the roller shafts 20 are driven at the same axial speed and in the same direction of revolution. However, the roller 14 is slightly greater in diameter than the roller 15. Hence, each roller tends to drive the roll "A" at a slightly different rate of speed, with the result that the roll "A" slips slightly on each of the supporting or cleaning rollers 14 and 15. I find that this action is extremely advantageous in that the difference between the peripheral speed of the rollers 14 and 15 may be made comparatively small, with the result that the scrubbing action betwen the rollers 14 and 15 and the roll "A" may be kept at the minimum required to clean the roll. Likewise, I have found that this action permits the cleansing of the roll "A" without damaging the surface thereof, which, as heretofore mentioned, is comparatively soft.

After the roll "A" has been cleansed by the scrubbing action of the rollers 14 and 15, heretofore explained, a slight amount of ink or pigment often remains on the roll. This is due to the fact that as the cleansing action progresses, some of the ink or pigment which is removed from the roll "A" is dissolved or suspended in the solvent solution, and will therefore be reconveyed to the rollers 14 and 15 and thereby to the roll "A", leaving a slight film of pigmented solution on the roll. I have therefore arranged my apparatus so that this film or solvent may be removed and the roll completely cleansed.

To remove any film of pigment that might remain on the roll "A" after the cleansing rolls 14 and 15 have completed their work, I provide a pair of spaced rollers 16 and 17, which are covered with fabric and on which the roll "A" is positioned by the operator after its removal from the cleansing rollers 14 and 15. As shown, the rollers 16 and 17 are supported on suitable driving shafts 24, carried by the frame members 10 and 11, and continuously driven, as will be hereinafter more fully described.

The rollers 16 and 17 coact with the roll "A" in a manner similar to that of the rollers 14 and 15, that is, the rollers are provided with a fabric covering, and the roller 17 has a greater diameter than the roller 16. Therefore, the rollers 16 and 17 will tend to drive the roll "A" at a slightly different speed, with the result that there will be some amount of slippage between the roll "A" and each of the rollers 16 and 17, thereby providing a rubbing action therebetween.

The solvent solution or liquid which is used to cleanse the roll, as heretofore described, is highly volatile, and therefore it is desirable to so arrange the mechanism that the fabric on the rollers 16 and 17 serve to dry the roll, as well as to cleanse the roll from any pigment remaining thereon. I therefore find it is convenient to so form the cloth covering on the rollers 16 and 17 in the nature of an elongated belt, as shown in Fig. 1, at 30. Referring to this figure, namely, Fig. 1, it will be noted that the belts 30 are looped around the rollers 16 and 17, extending downwardly adjacent the bases wherein they are supported by suitable idler rollers 31.

The arrangement is such that one of the belts 30, with which the periphery of the roll "A" contacts, is kept moist with fresh or unpigmented solvent. As shown, the belt 30 on the roller 16 is kept moist with a pigment or ink solvent. Such solvent is supplied through the medium of a suitable conduit 40, through which the solvent is fed and which is forced by a suitable pump 41, which, in turn, is supplied with solvent from a container or reservoir 43. The conduit 40 is connected with an elongated tube 44 having a series of openings or jets 45, arranged to project the solvent on the belt in the form of a light film or spray. This maintains the belt moist and enables the belt 30 of the roller 16 to act on the roll "A" with a moist wiping action, while the unmoistened belt 30 of the roller 17 wipes the roll "A" dry, thereby completely removing all trace of pigment and solvent therefrom.

It will be noted that I have provided two sets of rollers 16 and 17, one set lying on each side of the rollers 14 and 15. This arrangement permits the operator to place one roll to be cleaned on the rollers 14 and 15, and after these rollers have completed their function, remove the roll to one pair of rolls 16 and 17, taking at that time a second roll "B" from the other pair of rollers 16 and 17, thereby permitting substantially uninterrupted operations.

The rollers 14 and 15, as well as the rollers 16 and 17, are all continuously driven, and each roll is arranged so that it may be readily removed to permit either the cleansing of the roll or the removal of the coverings thereon. The shafts 20 and 24 which support the various rolls, are readily removable from the frame. As shown in Fig. 4, the shaft 20 or 24 is provided with a suitable key 50, which engages the key way 51 in the roll. The key 50 also engages a key way 52 in a bushing 53, which is rotatably mounted in the left-hand frame member 10. One end of each shaft is provided with a suitable knob or handle 54 by means of which the operator may conveniently withdraw the shaft from its bearings, thereby freeing the roller supported thereby. As shown, when the shaft is withdrawn, the roller drops but a slight distance. Hub portions 56 of each roll engage suitable rests 57, which are secured to the inner faces of frame members 10 and 11, thereby preventing the roller from dropping.

The rollers are driven by a suitable motor 60 which drivingly rotates a gear 61 through the medium of a belt 62, and pulleys 63 and 64, carried by the armature shaft 65, and the shaft 66, which supports the gear 61, respectively. The gear 61 meshes with a gear 66a drivingly secured to a shaft 67 journalled in the frame member 10, and a gear 68 drivingly connected to the shaft 67 meshes with a gear 69 on a shaft 70. The shaft 70 in turn carries a sprocket 72, which is drivingly connected by a suitable driving chain 74, to a sprocket 73, carried by the shaft 20 of the roller 15. The sprocket 73 is secured to a bushing 53, which coacts with the shaft 20 of the roller 15, thereby driving such roller. Integral with the sprocket 73 is a sprocket 74, which is connected by a sprocket chain 75, with a compound sprocket member 76 carried by the bushing 53 of the shaft 20 of the roll 14, thereby driving the roll 14. The other sprocket 76a of the composite sprocket member 76 is connected by means of a sprocket drive chain 77, with a compound sprocket member 78 carried by the bushing 53 of the shaft of the left-hand

roller 17, thereby driving such roller. The other sprocket of the compound sprocket member 78 is connected by a suitable drive chain 79 to a sprocket 80 carried by the bushing 53 on the shaft 24 of the left-hand roller 16.

The right hand rollers 16 and 17 are driven in a manner similar to the drive of the left-hand rollers 16 and 17. As shown, sprocket chains 81 and 82 drive these rolls from the bushing 53 of the roller 15 in the same manner as heretofore described in connection with the left-hand rolls 15 and 16.

The idler rollers 31 which support the lower ends of the belt 30 are readily removable from the machine to permit the changing of the belt. As shown, each idler roller is supported by its respective belt 30, tension being applied to the belts by suitable bearing blocks 90, which engage the shaft 91 of the rollers 31. The bearing blocks 90 are mounted in vertically extending guideways 92 in members 93, which are carried by the inner faces of the frame plates 10 and 11, respectively. Each bearing block 90 is provided with a lug 95 extending into a recess 96 in its respective member 93, and is threadingly engaged by a suitable threaded shaft 94, which extends upward through a lug 97 in the member 93. Each shaft 94 is rotatably mounted in its respective member 93 and is restrained against longitudinal movement by suitable collars 98. Each shaft 93 is provided at its upper end with a knob 99, by means of which it may be readily turned to increase or decrease the tension of its belt 30. To remove the belt or rollers 30, the bearing members 90 are moved upwardly in their respective guideways so that the roller may readily be moved to permit its withdrawal from the machine.

It will be seen from the above description that I have provided an efficient mechanism which first claims the pigment or ink from the surface of an offset printing roll by the use of suitable solvents with a scrubbing action, and thereafter removes any film that might remain on the offset roll by a moist wiping action. Such apparatus has been arranged so that the rolls may be cleaned in as short an interval of time as possible, thereby insuring substantially continuous operation.

I claim:

1. A printing roll cleaning mechanism, comprising a frame, a pair of spaced rollers mounted in said frame and arranged to simultaneously support a roll to be cleaned, each of said rollers being provided with a fabric belt, said belts being looped about their respective rollers, the portion of the belts looped over the rollers supporting the roll to be cleaned, means to maintain said belts taut, means to rotate said rollers at different peripheral speeds, and means to apply a solvent to one of said belts.

2. A roll cleaning apparatus, comprising a frame, a pair of spaced rollers mounted in said frame with their axes in the same horizontal plane, and arranged to coact to support a roll to be cleaned, an independent fluid absorbent elongated belt covering, carried by each of said rollers, and interposed between the rollers and the roll, means to drive said rollers at the same axial speed and in the same direction, and one of said rollers having a diameter greater than the diameter of the other roller, means to moisten one of said belts whereby a moist wiping action is maintained between one of said rollers and the roll to be cleaned, and a dry wiping action is maintained between the other roller and the roll.

GUIDO VON WEBERN.