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(72) Inventors RUDI JUNGHANS and HERMANN BEISEL

(19)

(54) WASHING DEVICE FOR CLEANING THE BLANKET CYLINDER OF AN OFFSET PRINTING MACHINE

(71) We, HEIDELBERGER DRUCKMASCHINEN AKTIENGESELLSCHAFT, a body corporate organised under the laws of Germany, of 69 Heidelberg, Alte Eppelheimer Strasse 15—21, Federal Republic of Germany, do hereby declare this invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described, in and by the following statement:—

The invention relates to washing devices for cleaning the blanket cylinders of offset printing machines.

German published Patent Specification No. 2,122,515 discloses a cleaning device for a duplicating machine, in which two rollers, termed cleaning rollers, are applied against the surface of the blanket cylinder which is to be cleaned and cooperate with a metering roller which is disposed in the gap formed between them and which is charged with fresh cleaning liquid.

This device has the disadvantage that the two rollers participating in the cleaning operation have to serve a dual purpose. The first of the two cleaning rollers serves in fact to transfer the fresh cleaning liquid to the rubber blanket and at the same time to carry away the dirt on the latter, while the second roller, disposed downstream of the first, similarly has to serve as a washing solution feed roller and also has to fulfil the functions of a cleaning roller and doctor roller. Since only the second roller lying against the rubber blanket cooperates with a stripper, the dirt removed by the first cleaning roller from the blanket roller is transferred to the metering roller, on which it is mixed with the fresh cleaning liquid, particularly through the friction in the gap between the metering roller and the second cleaning roller. The cleaning action of this device is thereby greatly reduced and the washing operation thus considerably retarded.

In the washing device of German Patent Specification No. 2,158,185 which is adapted to be applied against the blanket cylinder of an offset machine, the disadvantages of the previously mentioned device are overcome by providing three rollers, namely a distributor roller, a washing roller, and a doctor roller, on the blanket cylinder, since only one separate function is allocated to each of these rollers.

In this washing device however, the fact that only one washing roller is applied against the blanket cylinder and is driven exclusively by the latter has a disadvantageous effect. It has been found in practice, that, when fresh washing solution is applied on or over the washing roller, the fresh washing solution and residues of ink may accumulate in the gap between the washing roller and the blanket cylinder and thus give rise to so-called "aquaplaning" between the soft coating of the washing roller and the rubber blanket. The consequence is that the washing roller partly stops or even turns backwards. Since the dirt or ink residues are removed from the blanket cylinder in accordance with the principle of the splitting of wet liquid films, there is no doubt that by providing a single washing roller it is not possible to achieve an optimum cleaning action in a short period of time. Furthermore, the drying process is retarded in this device, because both the distributor roller and the washing roller always run wet and after the feeding of washing solution has been stopped they must first run dry.

The object of the present invention is to provide a washing device having a cleaning action of improved efficiency which enables the time required for the washing operation and subsequent drying to be reduced.

According to the present invention there is provided a washing device for the blanket cylinder of an offset printing machine comprising a doctor roller, first and second washing rollers mounted for movement from an inoperative position into an operating position in which, when the

device is in use, both the washing rollers lie in contact with the doctor roller and with the blanket cylinder to effect a driving connection therebetween, and execute axial traversing movements relative to the blanket cylinder, a distributor roller which lies in contact with the first washing roller and means for feeding a controlled supply of fresh washing solution to the distributor roller.

This arrangement results in effective cleaning of the blanket cylinder within a short period of time and with an economical consumption of washing solution. By virtue of the use of two washing rollers, the ink and dirt on the blanket cylinder are quickly loosened and therefore easily removed from the blanket cylinder. Furthermore, since both cylinders are in contact with, and therefore driven by the doctor roller, the washing device runs continuously even when the rollers are passing over the gap in the blanket cylinder and when excess liquid accumulates between the washing rollers and the blanket cylinder. Since only the first washing roller is charged with washing solution and the second washing roller exclusively carries off dirty solution, the time taken to dry the blanket cylinder immediately after the washing operation is kept short.

The washing device may be constructed as a single unit for separate mounting on printing machines or as an integral part of the machine.

In order to achieve particularly good cleaning action and also an intensive drying action with the washing device and to enable the latter to be rapidly brought into and out of action, the second washing roller is preferably disposed downstream of the first washing roller, in relation to the direction of rotation of the blanket cylinder, and the two washing rollers together with the distributor roller are grouped together as a conjointly displaceable unit. The doctor roller is also preferably associated with a doctor blade which is mounted for movement into contact with the doctor roller simultaneously with the movement of the two washing rollers.

Advantageously, the washing rollers and the distributor roller are radially sprung and mounted floatingly in guides. The pressure by which the washing rollers are applied both against the doctor roller and against the blanket cylinder can thereby be kept constant even when different thicknesses of paper are printed and the blanket cylinder is adjusted accordingly, while in addition irregularities in the surface of the rubber blanket are compensated for.

For ease of operation of the washing device, washing rollers are desirably arranged so that they can be brought into and out of their operating positions by means of an operating lever and a common actuating shaft, on which both a first control hub for controlling the doctor and a second control hub for displacing the washing rollers in conjunction with the distributor roller are fastened.

In order that the invention may be better understood, a preferred embodiment thereof will now be described, by way of example only, with reference to the accompanying drawings, in which:—

Figure 1 is a front view of a washing device in the operative position, viewed from the operating side of the machine.

Figure 2 is a side view of the same device in the inoperative position, showing the axial springing of the individual rollers.

Figure 3 is a plan view, partly in section, of Figures 1 and 2 showing the arrangement of the washing medium supply system, and

Figure 4 is a plan view, partly in section, of Figures 1 and 2, showing the mounting of the washing rollers and the side drive of the doctor roller.

On the inner sides of the side walls 1 and 2 guides 5 are fastened on both sides by means of screws 4, in front of the blanket cylinder 3, in which guides a first washing roller 6 and, downstream in relation to the direction of rotation of the blanket cylinder 3, a second washing roller 7 are mounted floatingly and in such a manner as to be capable of traversing. The washing rollers 6 and 7 are provided with a soft covering 8, which however does not absorb moisture. Wide cam discs 11 which have inclined end faces 12 are fastened on the shafts 9 and 10 of the washing rollers 6 and 7, and ball bearings 13 are provided on the ends of these shafts 9 and 10.

The inclined end faces 12 of the wide cam discs 11 run against cam rollers 14 and thereby effect the traversing of the washing rollers 6 and 7. The cam rollers are mounted for rotation in holders 15, which are fastened on both sides on the inner sides of the side walls 1 and 2 by means of screws 16. In the peripheral surface of the wide cam disc 11 O-rings 17 are inserted, which in the operative position of the washing device are in contact with the respective oppositely situated bearing rings 18 of the blanket cylinder 3 and thus drive the washing rollers 6 and 7 by frictional connection.

In the region of the ball bearings 13 of the first washing roller 6, spring levers 19 which are rockable about pins 20 are disposed on both sides on the inner sides of the side walls 1 and 2. Each of the spring levers is provided with an inclined surface at its end and at its centre, with a spring pin 22, which is loaded by a compression spring, the compression spring 23 being supported against a surface

of a blind bore 24 provided in the spring lever 19 and pressing the spring pin 22 against the respective ball bearing 13 of the first washing roller 6.

Furthermore, on the inner side of the side walls 1 and 2, in the region of the floating ball bearings 13 of the second washing roller 7 a shoulder lever 25 provided with a supporting shoulder 26 is articulated about a bearing pin 27 on each side. Each of these shoulder levers 25 is provided at its upper end with a supporting screw 28 against which presses a spring bearing 29 disposed on the end of an adjusting screw 30. The pressure of the spring bearing 29 against the supporting screw 28 and the resulting force by which the supporting shoulder 26 is pressed against the floating ball bearing 13 of the second washing roller 7 are produced with the aid of a compression spring 31, which is disposed between the spring bearing 29 and an additional spring abutment 32 provided on the adjusting screw 30. The compression spring 31 is supported against the spring abutment 32, which is made fast to the inner side of the respective side wall 1 or 2.

Upstream of the first washing roller 6, viewed in its direction of rotation, is disposed a distributor roller 33, which is provided with a firm covering 34. The firm covering 34 is preferably composed of a hard plastics material. The ball bearings 35 of the distributor roller 33 are likewise mounted floatingly in guides 36 fastened on both sides on the inner side of the side walls 1 and 2. In the region of these floating ball bearings 35, rocking levers 37 adapted to rock about pivot pins 38 are mounted on both sides on the inner sides of the side walls 1 and 2.

Each of the rocking levers 37 is provided at its end with a supporting surface 39 which is supported against the inclined surface 21 of the respective spring lever 19. At the other end of each rocking lever 37 an eyebolt 41 is articulated by means of a pin 40; the threaded portion 42 of the eyebolt 41 extends in the vertical position through a guide block 43 and can be clamped to the latter by means of a cross-wing nut 44. The guide block 43 is provided with a lateral cutout extending to its centre and is made fast by means of a pin 45 in the respective side wall 1 or 2. In addition, each rocking lever 37 is provided in the region of its supporting surface 39 with a spring pin 46 loaded by a compression spring 47 which is supported against the surface of a blind bore 48 provided in the rocking lever 37 and which thus presses the distributor roller 33 against the first washing roller 6.

Above the distributor roller a drip-feed tube 51 is bolted to the machine frame with the aid of holders 49 and threaded bolts 50, the tube 51 being provided with nozzle apertures 52. A drain plug 53 is provided at one end of the drip-feed tube 51, while the other end is connected by way of an elbow 54 to a supply pipe 55 for the washing liquid. The supply pipe 55 contains a valve 56 which can be opened and closed as desired with the aid of a control lever 57.

A doctor roller 58, which is provided with a firm covering 59, is disposed upstream of the washing rollers 6 and 7 and is laterally offset in relation to the latter, on the opposite side to the blanket cylinder 3. The firm covering in question may be either a metallic material or a plastics material of high consistency. The doctor roller 58 is mounted for traversing with the aid of plain bearings 60 and 61 in the side walls 1 and 2 of the machine frame.

In the outer side of the side wall 1 is provided a recess 62 in which a gear 64 is mounted in ball bearings 63. The ball bearings 63 on the outer side of the gear 64 are embedded in a centring ring 65 which is bolted to the outer side of the side wall 1 by means of a clamp bolt 66. The gear 64 is provided with a bore and with two diametrically opposite guides grooves 68 through which extends the shaft 69 of the doctor roller 58.

In the centre of the gear 64 the shaft 69 is provided with two diametrically opposite recesses 70 through which extends a through-bolt 71 pinned to the shaft 69. On the ends of the through-bolt 71 two guide rollers 72 are mounted in needle bearings, these rollers being partly embedded in the recesses 70 and cooperating in the operating condition with the guide grooves 68 of the gear 64. A guide sleeve 73, which is provided with two guide rings 74, is fastened in front of the gear 64 on the end of the shaft 69 of the doctor roller 58. A lever 76, which is driven in a manner not illustrated and by rocking about a pivot point 77 effects the traversing of the doctor roller 58, is articulated inside these guide rings 74 by means of a hub 75.

A first control hub 79 is fastened, outside the side wall 2 on the operating side of the machine, on an actuating shaft 78 disposed in front of the doctor roller 58. This control hub 79 has a stop 80 which cooperates with a stop pin 81 fastened in the side wall 1. In addition, it is equipped with an operating lever 82 and with a swivelling shoulder 83, on which a short control lever 85 is articulated by means of a pin 84. The other end of the short control lever 85 is articulated by means of another pin 86 to a control lever 87 in which the bearing pin 88 of the square 89 is fastened. A doctor 90 is secured on one side of the square 89.

On the same actuating shaft 78, but laterally offset in relation to the first control

hub 79, there is fastened inside the side wall 1 of the machine frame a second control hub 91, on which, by means of a pin 92, a long control rod 93 is articulated on whose other end a cam disc 94 is mounted movably on another pin 95, the cams 96 of this cam disc being in contact with the floating bearings 13 of the washing rollers 6 and 7.

Below the doctor roller 58 a collecting bowl 97 which is provided with an outlet pipe 98, is disposed in a stationary position in the range of operation of the doctor blade 90.

The mode of operation of the apparatus illustrated is described more fully below with reference to the drawings.

As illustrated in Figure 2, the floating ball bearings 13 of the washing rollers 6 and 7 are held by the two cams 96 of the cam disc 94 in the upper region of the guides 5 when the washing device is in the inoperative position. The washing rollers 6 and 7 are then in a disconnected position, that is to say they are disconnected both from the blanket cylinder 3 and from the doctor roller 58. When the washing device is in the inoperative position the first washing roller 6 is secured against falling out of the guides 5 in the downward direction by the upper of the two cams 96 of the cam disc 94, while the second, lower washing roller 7 is similarly secured by the supporting shoulder 26 of the shoulder levers 25. The distributor roller is held by the first washing roller 6, against which it bears permanently. The doctor blade 90 is also disconnected from the doctor roller 58 when the washing device is in the inoperative position.

For the purpose of cleaning the blanket cylinder 3 to remove dirt and residues of ink, the operating lever 82 fastened on the first control hub 79 is swivelled from its vertical position 99, in which the washing device is secured in the inoperative position, into an inclined control position 100 in which the stop 80 strikes against the stop pin 81 and which consistutes the operative position. By means of the short control lever 85 articulated on the swivelling shoulder 83, the square 89 fastened in the control lever 87 is thereby turned in such a manner that the doctor blade 90 mounted on its bears against the firm coating 59 of the doctor roller 58.

Through the swivelling movement of the operating lever 82, the second control hub 91 fastened on the acuating shaft 78 is simultaneously turned, whereby the long control rod 93 articulated on the second control hub 91 is moved in the direction of the blanket cylinder 3.

The cam disc 94 mounted in the end of the long control rod 93 is turned by the lever action in such a manner that its two cams 96 come out of the range of action of the floating bearings 13 of the two washing rollers 6 and 7. Consequently the first washing roller 6 can slide downwards in the guides 5 and bear against the blanket cylinder 3 and the doctor roller 58. The second washing roller 7, on the other hand, is pressed against the blanket cylinder 3 and the doctor roller 58 by the pressure applied by the supporting shoulders 26 of the shoulder levers 25 to the floating bearings 13.

The distributor roller 33 participates in this movement at the same time and through the spring force of the spring pin 46 disposed in the rocking lever 37 is continuously in pressure contact with the first washing roller 6.

At the same time as the rollers and doctor are brought into contact by means of the operating lever 82, the valve 56 disposed in the supply pipe 55 is opened by means of the control lever 57, and thus the supply of washing solution to the drip-feed tube 51 is freed.

The fresh washing solution can now drip on to the firm coating 34 of the distributor roller 33, where it is spread out between the first washing roller 6 and the distributor roller 33 and uniformly distributed over the soft covering 8 of the first washing roller 6. The first washing roller 6 transfers the fresh washing solution to the blanket cylinder 3 and at the same time removes part of the dirt from the latter, transferring this part of the dirt to the doctor roller 58 downstream of it.

It has been found advantageous for the amount of washing solution applied to the blanket cylinder 3 to be metered so as to be so small that it does not wash off the dirt from the cylinder but only slightly loosens it. This loosening takes place already in the region of the blanket cylinder 3 between the first washing roller 6 and the second washing roller 7, so that the remainder of the dirt which has thus been loosened but not yet carried away by the first washing roller 6 is taken off by the second washing roller 7 and likewise transferred to the doctor roller 58 disposed downstream. The firm coating 59 of the doctor roller 58 is continuously wiped by the doctor blade 90 applied against it and is freed of residues of ink and of dirty washing solution, which are passed to the collecting bowl 96, so that the doctor roller 58 always lies against the washing rollers 6 and 7 with a surface which has been wiped clean.

Since, as previously mentioned, only a small amount of washing solution is required, it is also entirely sufficient for the valve 56 to be opened only for a short time, that is to say for a few seconds, by means of the control lever 57. In practice this means that when the blanket cylinders 3 of the

plurality of printing units have to be cleaned in succession in a multicolor printing machine, the washing rollers and doctor are first brought into contact and then the feeding of washing solution is started for each of the successive printing units. Experience has shown that this can be done within a few seconds. The apparatus described thus has so thorough and rapid a cleaning action that immediately after the washing rollers and doctors have been brought into operation in the last printing unit, the supply of washing solution for the individual printing units can be shut off at once, starting from the first.

For this purpose the supply of washing solution is shut off by closing the valve 56 by means of the control lever 57 and the washing rollers 6 and 7 are brought out of contact with the blanket cylinder 3 and with the doctor roller 58 and the doctor blade 90 is brought out of contact with the firm covering 59 of the doctor rollers 58 by turning the operating lever 82 from its inclined control position 100 into its vertical position 99. The long control rod 93 is thus moved away from the blanket cylinder 3, whereby the two cams 96 of the cam disc 94 are pressed against the floating bearings 13 of the washing rollers 6 and 7, which are thus at the same time lifted off the blanket cylinder 3 and doctor roller 58, together with the distributor roller 33.

In order to gain access to the first washing roller 6 and to the distributor roller 33, that is to say in order to be able to dismantle them, the clamping of the eyebolts 41 to the guide blocks 43 is released by slackening the cross-wing nuts 44 on the threaded portion 42 of the eyebolts 41. The eyebolts 41 are then swung away laterally out of the recessed guide blocks 43, and the rocking levers 37 are turned about the pivot pins 38 until their supporting surface 39 lifts off the inclined surface 21 of the spring levers 19 and the supporting surface 39 itself is vertical. The spring levers 19 can now also be swung upwards about the pins 20, away from the first washing roller 6. Both the first washing roller 6 and the distributor roller 33 then lie completely free and are readily accessible.

Since the loosened ink is removed from the blanket cylinder 3 in accordance with the principle of separation of wet liquid films, the provision of a second washing roller 7 additionally to the washing roller 6 is found particularly advantageous because of the thorough cleaning action and the consequent saving of time in the washing process. The traversing of both of the washing rollers is also advantageous from the point of view of effective cleaning, since in this way the ink and dirt on the blanket cylinder 3 are more effectively attacked, more quickly dissolved, and more easily removed.

Since the washing rollers 6 and 7 are driven not only by the bearer rings 18 of the blanket cylinder 3 with the aid of the O-rings 17, but also frictionally by bearing directly against the positively driven doctor roller 58, the rotation of the washing rollers 6 and 7 is not interrupted when they pass over the cylinder gap of the blanket cylinder 3, but is continued without interruption. The consequence is that even after passing over the cylinder gap on the one hand fresh washing solution will always be applied by the clean first washing roller 6 to the blanket cylinder, while on the other hand the clean covering 8 of the second washing roller 7 will always be ready to receive the dirt from the blanket cylinder 3, since even while passing over the cylinder gap the washing roller 6 and 7 will have given up to the doctor roller 58 the dirt removed from the blanket cylinder just before the cylinder gap.

WHAT WE CLAIM IS:—

1. A washing device for the blanket cylinder of an offset printing machine comprising a doctor roller, first and second washing rollers mounted for movement from an inoperative position into an operating position in which, when the device is in use, both the washing rollers lie in contact with the doctor roller and with the blanket cylinder to effect a driving connection therebetween, and execute axial traversing movements relative to the blanket cylinder, a distributor roller which lies in contact with the first washing roller, and means for feeding a controlled supply of fresh washing solution to the distributor roller.

2. A washing device according to claim 1 wherein the two washing rollers and the distributor rollers are mounted for simultaneous movement between the operating and inoperative positions.

3. A washing device according to claim 2 wherein the doctor roller is associated with a doctor blade which is mounted for movement into contact with the doctor roller simultaneously with the movement of the two washing rollers in the operating position.

4. A washing device according to claim 3 wherein the washing rollers are movable between their operating and inoperative positions by rotation of an actuating shaft which carries a first control hub for controlling movement of the doctor blade, and a second control hub for effecting displacement of the washing rollers and the distributor roller.

5. A washing device according to claim 4 wherein the first control hub is provided

plurality of printing units have to be cleaned in succession in a multicolor printing machine, the washing rollers and doctor are first brought into contact and then the feeding of washing solution is started for each of the successive printing units. Experience has shown that this can be done within a few seconds. The apparatus described thus has so thorough and rapid a cleaning action that immediately after the washing rollers and doctors have been brought into operation in the last printing unit, the supply of washing solution for the individual printing units can be shut off at once, starting from the first.

For this purpose the supply of washing solution is shut off by closing the valve 56 by means of the control lever 57 and the washing rollers 6 and 7 are brought out of contact with the blanket cylinder 3 and with the doctor roller 58 and the doctor blade 90 is brought out of contact with the firm covering 59 of the doctor rollers 58 by turning the operating lever 82 from its inclined control position 100 into its vertical position 99. The long control rod 93 is thus moved away from the blanket cylinder 3, whereby the two cams 96 of the cam disc 94 are pressed against the floating bearings 13 of the washing rollers 6 and 7, which are thus at the same time lifted off the blanket cylinder 3 and doctor roller 58, together with the distributor roller 33.

In order to gain access to the first washing roller 6 and to the distributor roller 33, that is to say in order to be able to dismantle them, the clamping of the eyebolts 41 to the guide blocks 43 is released by slackening the cross-wing nuts 44 on the threaded portion 42 of the eyebolts 41. The eyebolts 41 are then swung away laterally out of the recessed guide blocks 43, and the rocking levers 37 are turned about the pivot pins 38 until their supporting surface 39 lifts off the inclined surface 21 of the spring levers 19 and the supporting surface 39 itself is vertical. The spring levers 19 can now also be swung upwards about the pins 20, away from the first washing roller 6. Both the first washing roller 6 and the distributor roller 33 then lie completely free and are readily accessible.

Since the loosened ink is removed from the blanket cylinder 3 in accordance with the principle of separation of wet liquid films, the provision of a second washing roller 7 additionally to the washing roller 6 is found particularly advantageous because of the thorough cleaning action and the consequent saving of time in the washing process. The traversing of both of the washing rollers is also advantageous from the point of view of effective cleaning, since in this way the ink and dirt on the blanket cylinder 3 are more effectively attacked, more quickly dissolved, and more easily removed.

Since the washing rollers 6 and 7 are driven not only by the bearer rings 18 of the blanket cylinder 3 with the aid of the O-rings 17, but also frictionally by bearing directly against the positively driven doctor roller 58, the rotation of the washing rollers 6 and 7 is not interrupted when they pass over the cylinder gap of the blanket cylinder 3, but is continued without interruption. The consequence is that even after passing over the cylinder gap on the one hand fresh washing solution will always be applied by the clean first washing roller 6 to the blanket cylinder, while on the other hand the clean covering 8 of the second washing roller 7 will always be ready to receive the dirt from the blanket cylinder 3, since even while passing over the cylinder gap the washing roller 6 and 7 will have given up to the doctor roller 58 the dirt removed from the blanket cylinder just before the cylinder gap.

WHAT WE CLAIM IS:—

1. A washing device for the blanket cylinder of an offset printing machine comprising a doctor roller, first and second washing rollers mounted for movement from an inoperative position into an operating position in which, when the device is in use, both the washing rollers lie in contact with the doctor roller and with the blanket cylinder to effect a driving connection therebetween, and execute axial traversing movements relative to the blanket cylinder, a distributor roller which lies in contact with the first washing roller, and means for feeding a controlled supply of fresh washing solution to the distributor roller.

2. A washing device according to claim 1 wherein the two washing rollers and the distributor rollers are mounted for simultaneous movement between the operating and inoperative positions.

3. A washing device according to claim 2 wherein the doctor roller is associated with a doctor blade which is mounted for movement into contact with the doctor roller simultaneously with the movement of the two washing rollers in the operating position.

4. A washing device according to claim 3 wherein the washing rollers are movable between their operating and inoperative positions by rotation of an actuating shaft which carries a first control hub for controlling movement of the doctor blade, and a second control hub for effecting displacement of the washing rollers and the distributor roller.

5. A washing device according to claim 4 wherein the first control hub is provided

* C L M S *

with a stop and a rocking shoulder, the rocking shoulder being articulated to a control lever which controls the movement of the doctor blade, the stop cooperating with a fixed stop member to secure the doctor in contact with the doctor roller, and the second control hub is spaced from the first control hub and carries a control rod which is connected to a cam disc, movement of which effects the movement of the washing rollers between their operative and inoperative positions.

6. A washing device according to any one of claims 1 to 5 wherein the two washing rollers are disengaged from the doctor roller in their inoperative positions.

7. A washing device according to any one of claims 1 to 6 wherein the washing rollers and the distributor roller are floatingly mounted in guides and are radially movable therein against the bias of springs.

8. A washing device according to claim 7 wherein the first washing roller is movable in its guides against the bias of first spring pins carried by two spring levers mounted adjacent the guides of the first washing roller to rotation about an axis parallel to the axis of the first washing roller, the distributor roller is movable in its guides against the bias of second spring pins carried by two rocking levers which are mounted adjacent the guides of the distributor roller for rotation about an axis parallel to the axis of the distributor roller and which abut respective ones of the said spring levers, and the second washing roller is movable in its guides against the bias of spring-loaded levers having supporting shoulders by which the second washing roller is carried, the spring loaded levers being mounted adjacent the guides of the second washing roller for rotation about an axis parallel to the axis of the second washing roller.

9. A washing device according to any one of claims 1 to 8 wherein the doctor roller is mounted to execute axial traversing movements relative to the blanket cylinder when the device is in use.

10. A washing device substantially as hereinbefore described with reference to the accompanying drawings.

11. An offset printing machine including a washing device for its blanket cylinder according to any one of claims 1 to 10.

For the Applicants.
CARPMAELS & RANSFORD,
Chartered Patent Agents,
43 Bloomsbury Square,
London, WC1A 2RA.

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