

PATENT SPECIFICATION

(11)

1 534 352

1534 352

(21) Application No. 8919/76 (22) Filed 5 March 1976 (19)

(31) Convention Application No. 2 531 886

(32) Filed 17 July 1975 in

(33) Fed. Rep. of Germany (DE)

(44) Complete Specification published 6 Dec. 1978

(51) INT. CL.² B41F 35/06 35/02

(52) Index at acceptance

B6C 104 155 251 701 713 BAE

(72) Inventor WILLI JESCHKE



(54) CLEANING DEVICE FOR PRINTING UNITS OF OFFSET PRINTING MACHINES

(71) We, HEILDELBERGER DRUCK-
MASCHINEN AKTIENGESELLSCHAFT, a body
corporate organised under the laws of Ger-
many, of Alte Eppelheimer Strasse 15-21,
Heidelberg, Germany, do hereby declare
the 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 offset printing
machines, and in particular to the cleaning
thereof.

Conventionally, offset printing machines
include plate, blanket, and impression
cylinders and also a washing device for
the blanket cylinder. In known washing
devices for cleaning the rubber-covered
surface of the blanket cylinder, the device
is brought up against the blanket cylinder
whilst the blanket cylinder is disconnected
from both the plate cylinder and the im-
pression cylinder. Thus, the washing pro-
cess is carried out with impression off.
After the surface of the rubber blanket has
been cleaned the blanket cylinder is again
brought into contact with the plate cylin-
der and the impression cylinder and print-
ing can start again immediately. A wash-
ing device of this type is shown, for
example, in German Offenlegungsschrift
No. 1,761,111.

German Patent Specification No.
1,561,008 discloses a washing device for the
blanket cylinder of a reel-fed rotary press,
which washing device is set in motion dur-
ing the running of the press. In this
arrangement, the blanket cylinder also acts
as the impression cylinder. The cleaning
rollers of the washing device, rotating in
the opposite direction, remove particles of
dirt adhering to the surface of the blanket
cylinders while the moving paper web
carries off excess washing fluid.

Neither of the above-mentioned washing
devices is capable of cleaning the impres-
sion cylinder because either the impression
cylinder is disconnected during the cleaning

operation or the web of paper is utilized for
removing excess washing fluid, making it
impossible to establish a connection be-
tween the blanket cylinder and the impres-
sion cylinder.

In the case of sheet-fed offset presses it
is usual for various sizes of sheet to be dealt
with. When sheets of a smaller size are
being printed the areas of the impression
cylinder which are not covered by the sheet
frequently become dirty. If the sheet-fed
offset press is then used for larger sheet
sizes, the impression cylinder has to be
cleaned before printing starts.

In the case of multi-colour recto printing
machines of the type which can be changed
over to perfecting, it is necessary to clean
the impression cylinder even more often
than with the above-mentioned sheet-fed
rotary presses. In the operating position
of such machines, for recto and verso
printing the sheet is turned between a first
and a second printing unit. As a result, in
the second printing unit the turned sheet,
printed on one side, rests on the impression
cylinder by its still wet surface which has
just been printed on the recto side. In this
process it is inevitable that ink from the
freshly printed surface of the sheets is
transferred to and accumulates on the con-
vex surface of the impression cylinder. To
keep this build-up of ink to a minimum, the
convex surface of the impression cylinder
is provided with either a cover or a special
surface. In spite of these measures it is
necessary to clean the convex surface of
the impression cylinder at certain intervals
of time because, even with the optimal con-
stitution of the convex surface, accumula-
tions of ink cannot be entirely prevented.
This accumulated ink is eventually picked
up by the sheet as it passes through, so that,
after a saturation point has been reached,
the prints are no longer usable. High
quality printing is therefore only possible
with perfecting machines if the impression
cylinder which follows the turning drum is
cleaned regularly.

9

According to the present invention we provide a printing machine comprising plate, blanket and impression cylinders, and a washing device movable into contact with the blanket cylinder and means for moving the blanket cylinder into contact with the impression cylinder during contact of the washing device with the blanket cylinder for cleaning the impression cylinder.

We have found, surprisingly, that the impression cylinder can be cleaned rapidly and reliably with known washing devices by way of the blanket cylinder. There is no further need for the manual washing of the impression cylinder which has hitherto had to be performed by the operator when changing from a smaller to a larger sheet size, or with perfecting machines. It is possible to economize on a special washing device, the automatic washing of the impression cylinder as well as on the space which would have to be provided for it.

Advantageously, the blanket cylinder can be brought into contact simultaneously both with the impression cylinder and also the plate cylinder, the inking and dampening rollers being lifted off the plate cylinder. In this way it is easily possible to utilize the so-called throwing-in pressure of all the printing unit cylinders for the washing of the impression cylinder. As a result the layout of the switching system can be simplified. Care must be taken, of course, to ensure that no washing medium is employed which might attack the off-set plate.

The invention will now be described, by way of example only, with reference to the accompanying schematic drawings, in which:—

Figure 1 illustrates a first offset printing unit with the printing unit cylinders in engagement and a washing device in contact with the blanket cylinder;

Figure 2 is a block circuit diagram with the control elements for switching the printing unit of Figure 1; and

Figure 3 illustrates a second printing unit in which the washing device is in the operating position and the blanket cylinder is only in contact with the impression cylinder.

In Figure 1, the second printing unit of a two-colour offset press is shown which can be changed over to perfecting. A transfer drum 1, of double diameter, passes the sheet which has been printed on one side to a turning drum 2 which forwards the sheet, turned, to the impression cylinder 3. On this impression cylinder 3 the sheet rests with its printed side on the cylinder jacket. In order to prevent set-off on the convex surface of the impression cylinder 3 during the subsequent printing of the opposite side of the sheet, a specially constructed metal foil 4 is stretched over the im-

pression cylinder. A blanket cylinder 5, which receives the image from a plate cylinder 6, prints the blank side of the sheet. When printing is completed the impression cylinder 3 transfers the sheet, which is printed on both sides, to the chain delivery 7.

As is usual with offset printing machines, there are a dampening unit 8 and an inking unit 9 of which the application rollers 13 and 14 can be brought into contact with the plate cylinder 6. A washing device 10 is also provided which can be brought into contact with the blanket cylinder 5.

In the switch position illustrated, the blanket cylinder 5 is in contact with the impression cylinder and the plate cylinder 6 whereas the dampening rollers 13 of the dampening unit 8 and the inking rollers 14 of the inking unit 9 are lifted off the plate cylinder 6. Meanwhile the washing device 10 is brought up against the blanket cylinder 5 and so is in the operating position. Washing fluid is applied in a measured quantity to the surface of the blanket cylinder 5 and first cleans the rubber blanket 12 and then also the impression cylinder 3. After application of the washing solution the two washing rollers 11 of the washing device 10 first take the softened dirt from the rubber blanket 12 and then also the particles of dirt and ink residue from the impression cylinder 3. Apart from the cleaning of the rubber blanket 12 and the metal foil 4 which is stretched over the impression cylinder 3, the printing plate 6 stretched over the plate cylinder 6 is also cleaned each time, as a subsidiary effect.

The control elements for tripping the operation of cleaning the plate cylinder 3 are shown in Figure 2. Shown on the control desk 15, indicated by the dash-dot line, are four pairs of push buttons 16, 17; 18, 19; 20, 21 and 22, 23. Push buttons 16 and 17 are for switching the machine on or off, respectively. They actuate the main motor 26 through an amplifier 24.

The pair of push buttons 18, 19 are for setting the paper in motion and preselecting the throw-in of the printing unit cylinders or cancelling both switching processes. If an electronic interrogation unit 27 mounted before each printing unit detects the arrival of a sheet, it emits a switching pulse which, amplified by the amplifier 28, acts upon an alternating current magnet 29 which effects the throw-in of the blanket cylinder 5 to the impression cylinder 3 and the plate cylinder 6.

The pair of push buttons 20 and 21 can also be used to bring about contact, again through the amplifier 28 and the alternating current magnet 29, between the blanket cylinder 5 and the adjacent cylinders 3 and 6 or to break this contact. Moreover

by operating the push buttons 20, 21 it is possible, through the amplifier 30, shown by the broken line, and the alternating current magnet 31, also shown by a broken line, to apply the dampening rollers 13 of the dampening unit 8 and the inking rollers 14 of the inking unit 9 to the plate cylinder 6 and to remove them from the plate cylinder. However, it is also possible to throw the application rollers 13 and 14 in and off by hand.

Finally, the pair of push buttons 22, 23 can be used, by way of the switching means 32, for example alternating current magnets, to swing the washing device 10 into the operating position and set it in operation or to swing it back into the neutral position and out of action. Naturally, the washing device can also be set in operation manually.

The manner of operation of the above-described device is as follows.

If it is required to clean the metal foil 4 of the impression cylinder 3 after a certain number of sheets have been spoilt, the paper motion is first stopped by way of the preselector push button 19, after which, owing to the failure of a sheet to arrive, the electronic interrogation unit 27 throws the blanket cylinder 5 off the impression cylinder 3 and the plate cylinder 6 by way of the amplifier 28 and the alternating current magnet 29. Then, by pressing the push button 16, the main motor 26 is switched via the amplifier 24 to a fixed speed. The push button 22 is then pressed, whereby the washing device 10 is brought into the operating position against the rotating blanket cylinder 12 and set in motion, that is to say washing solution is conveyed to the rubber blanket 12 in measured quantity by means of the washing rollers 11.

When the rubber blanket 12 of the blanket cylinder 5 has been washed for a few revolutions, the push button 20 is operated and, through the amplifier 28 and the alternating current magnet 29, the blanket cylinder 5 is thrown in to the impression cylinder 3 and the plate cylinder 6. The washing device 10 thereby follows the motion of the blanket cylinder 5, that is to say the washing rollers 11 remain in contact with the rubber blanket 12. Operation of the push button 20 effects, through the amplifier 30 and the alternating current magnet 31, the removal of the application rollers 13, 14 from the plate cylinder 6. If the switching means 30, 31 shown by the broken line in Figure 2 are omitted, the removal of the application rollers 13, 14 must be carried out manually before the push button 20 is operated.

After a short time the set-off sheet 4 on the impression cylinder 3 has been cleaned by way of the cleaned rubber blanket 12.

Operation of the push button 23 causes the washing device 10 to be swung into the inoperative position by the switching means 32 whereby the washing rollers 11 are detached from the rubber blanket 12 and the washing device itself is put out of action.

Pressure on the push button 21 lifts the cleaned rubber blanket cylinder 5 away from the impression cylinder 3 and the plate cylinder 6, both of which have likewise been cleaned, and the dampening rollers 13 of the dampening unit 8 and the inking rollers 14 of the inking unit 9 are released for subsequent application to the plate cylinder 6. Operation of the push button 19 sets the paper in motion and preselects the throw-in of the blanket cylinder. When the first sheet reaches the electronic interrogation unit 27 throw-in of the blanket cylinder takes place and the printing process start afresh.

As a variant of the switching arrangement shown in Figure 2 the amplifier 30 and the alternating current magnet 31 may be omitted if it is preferred, before pressing the push button 20 for bringing the blanket cylinder 5 up against the impression cylinder 3 and the plate cylinder 6, to throw the application rollers 13 and 14 off manually and to throw them in again by hand after the washing process. Similarly the washing device may also be operated manually instead of by switching means 22, 23 and 32.

In the printing unit arrangement shown in Figure 3, this may be a printing unit of any kind of offset printing machine which, just as in Figure 1, has a blanket cylinder 5, an impression cylinder 3 and a plate cylinder 6. The dampening and inking units have been omitted for the sake of clarity. The washing device 10 with the washing rollers 11 is switched into the operating position, that is to say the washing rollers are in contact with the rubber blanket 12. In contradistinction to the example of construction shown in Figures 1 and 2, the blanket cylinder 5 is in this case brought into contact with the impression cylinder 3 only. The advantage of this is that in choosing the washing medium it is not necessary to take into account the sensitive printing plate and, moreover, the cleaning of the impression cylinder takes slightly less time than when the plate cylinder 6 is also in contact with the blanket cylinder 5. Of course, with this form of embodiment of the invention it is not possible to utilize the normal throw-in of the blanket cylinder 5. Indeed a separate switching arrangement is needed exclusively to bring the blanket cylinder 5 up against the impression cylinder 3. With this form of construction it is also advantageous, for the purpose of cleaning the

(11)

4

1,534,352

4

impression cylinder 3, to give the blanket cylinder a preliminary wash before it is brought into contact with the impression cylinder 3.

- 5 The embodiments of the invention described above thus enable the impression cylinder to be cleaned quickly and reliably without an additional washing device, that is to say with simple means, in an automatic way.

WHAT WE CLAIM IS:—

- 15 1. A printing machine comprising plate, blanket and impression cylinders and a washing device movable into contact with the blanket cylinder and means for moving the blanket cylinder into contact with the impression cylinder during contact of the washing device with the blanket cylinder for cleaning the impression cylinder.

- 20 2. A printing machine according to claim 1, having dampening and inking rollers, and the blanket cylinder is movable simultaneously into contact with the impression cylinder and the plate cylinder when the dampening and inking rollers are out of contact with the plate cylinder, so that all three cylinders are cleaned by the washing device.

- 30 3. A printing machine according to claim 1 or claim 2, further comprising a switching arrangement for bringing the blanket cylinder into contact with the impression cylinder.

- 35 4. A printing machine substantially as

hereinbefore described with reference either to Figures 1 and 2 or to Figure 3 of the accompanying drawings.

5. A method of cleaning at least two of the three cylinders of an offset printing unit of an offset printing machine, the unit including a washing device, the method comprising operating the machine without a paper feed, taking pressure off the cylinders actuating the washing device whilst in contact with the blanket cylinder and thereafter moving the blanket cylinder into contact with the impression cylinder whilst maintaining contact of the blanket cylinder with the washing device so that the washing device cleans the blanket and impression cylinders.

6. A method according to claim 5, wherein the machine has dampening and inking rollers which are lifted off the plate cylinder, and the blanket cylinder is brought into contact with both the impression cylinder and the plate cylinder.

7. A method of cleaning at least two of two of the three cylinders of an offset printing unit of an offset printing machine, the method being substantially as herein described with reference either to Figures 1 and 2 or to Figure 3 of the accompanying drawings.

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



(11)

4

1,534,352

4

impression cylinder 3, to give the blanket cylinder a preliminary wash before it is brought into contact with the impression cylinder 3.

- 5 The embodiments of the invention described above thus enable the impression cylinder to be cleaned quickly and reliably without an additional washing device, that is to say with simple means, in an automatic way.

WHAT WE CLAIM IS:—

1. A printing machine comprising plate, blanket and impression cylinders and a washing device movable into contact with the blanket cylinder and means for moving the blanket cylinder into contact with the impression cylinder during contact of the washing device with the blanket cylinder for cleaning the impression cylinder.

2. A printing machine according to claim 1, having dampening and inking rollers, and the blanket cylinder is movable simultaneously into contact with the impression cylinder and the plate cylinder when the dampening and inking rollers are out of contact with the plate cylinder, so that all three cylinders are cleaned by the washing device.

3. A printing machine according to claim 1 or claim 2, further comprising a switching arrangement for bringing the blanket cylinder into contact with the impression cylinder.

4. A printing machine substantially as

hereinbefore described with reference either to Figures 1 and 2 or to Figure 3 of the accompanying drawings.

5. A method of cleaning at least two of the three cylinders of an offset printing unit of an offset printing machine, the unit including a washing device, the method comprising operating the machine without a paper feed, taking pressure off the cylinders actuating the washing device whilst in contact with the blanket cylinder and thereafter moving the blanket cylinder into contact with the impression cylinder whilst maintaining contact of the blanket cylinder with the washing device so that the washing device cleans the blanket and impression cylinders.

6. A method according to claim 5, wherein the machine has dampening and inking rollers which are lifted off the plate cylinder, and the blanket cylinder is brought into contact with both the impression cylinder and the plate cylinder.

7. A method of cleaning at least two of two of the three cylinders of an offset printing unit of an offset printing machine, the method being substantially as herein described with reference either to Figures 1 and 2 or to Figure 3 of the accompanying drawings.

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

ERRATUM

SPECIFICATION NO 1534352

Page 1, line 1, (71) for HEILDELBERGER read HEIDELBERGER

THE PATENT OFFICE
8 May 1979

Bas 56241/8