March 15, 1955 H. F. GEORGE 2,704,029

DEVICE FOR CLEANING INKED PRINTING SURFACES OF ROTARY DUPLICATING MACHINES

Filed Aug. 1, 1951 2 Sheets-Sheet 1

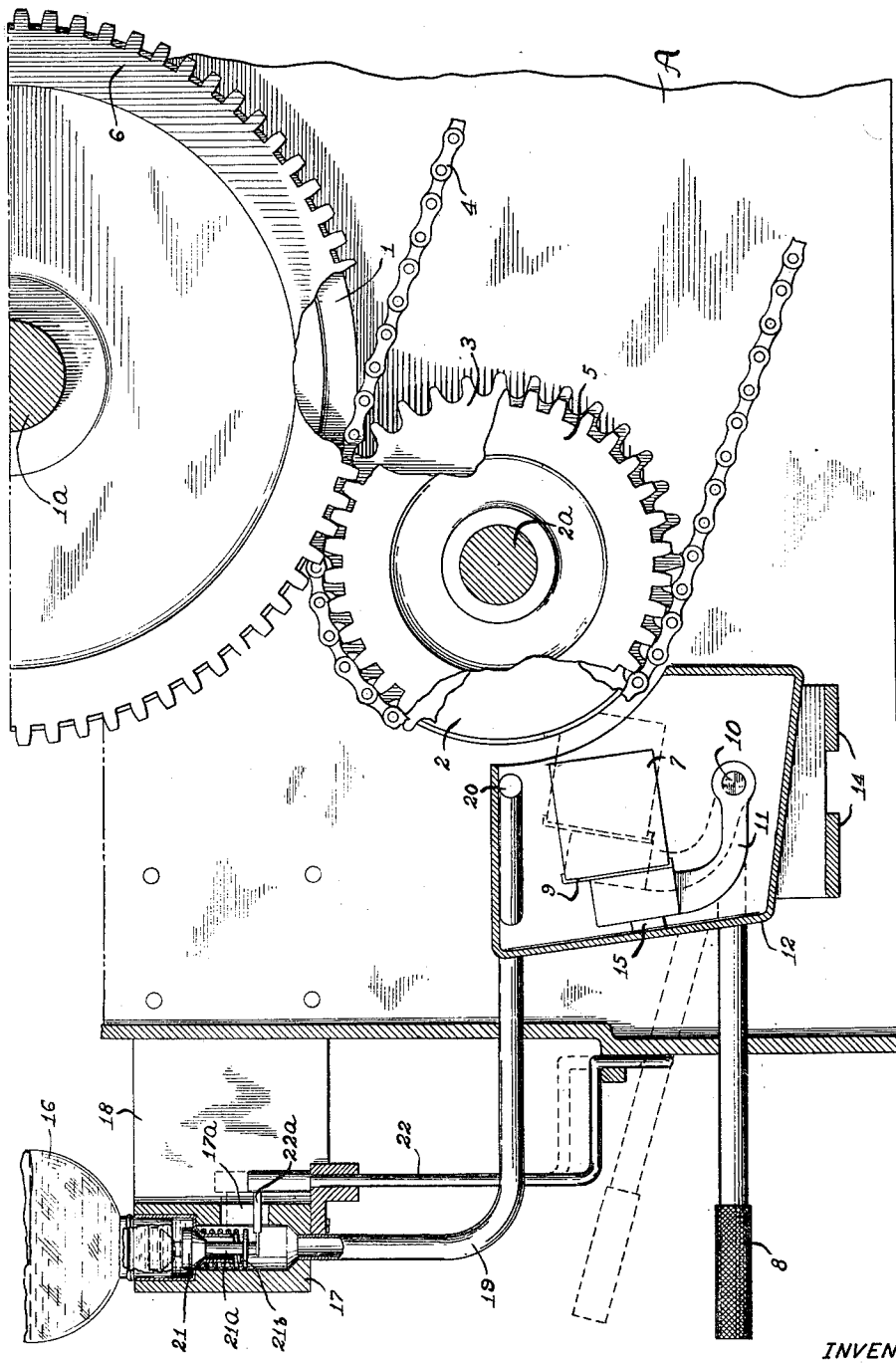


FIG. 1

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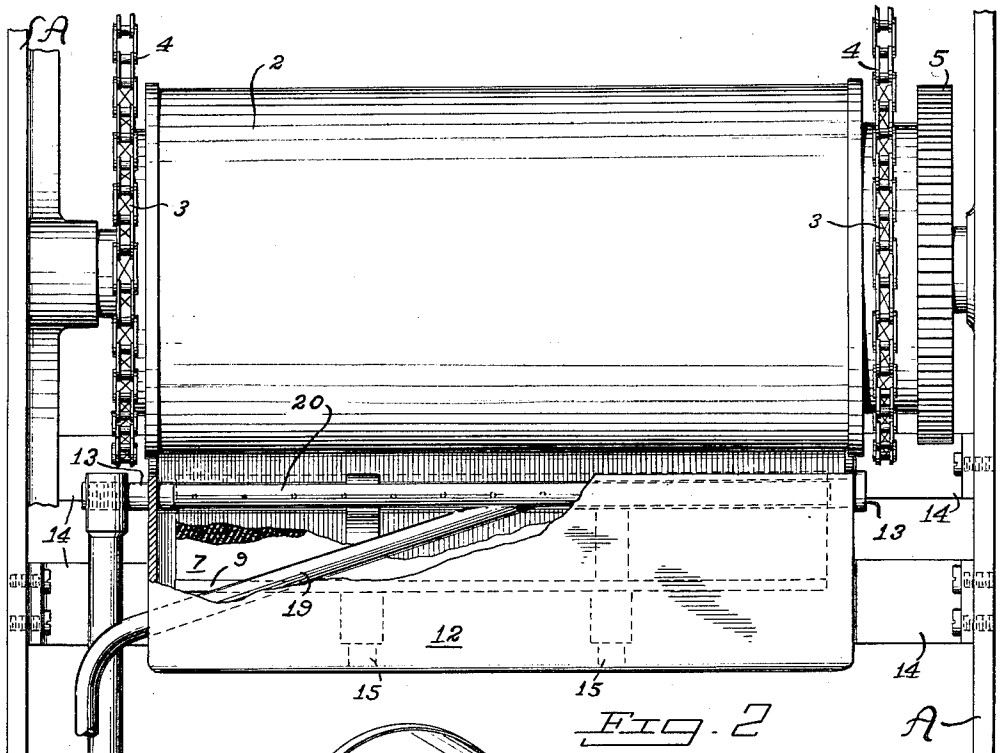


FIG. 2

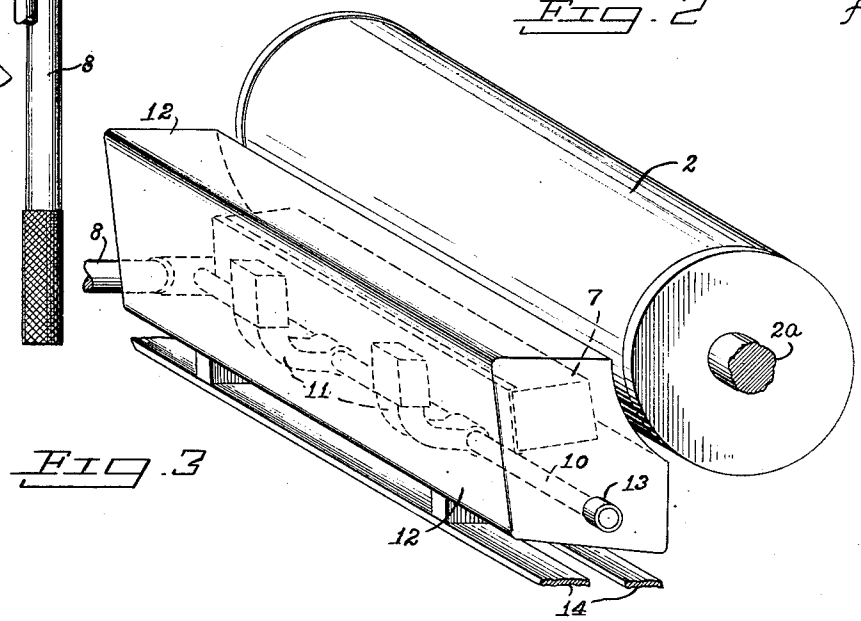


FIG. 3

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2,704,029

DEVICE FOR CLEANING INKED PRINTING SURFACES OF ROTARY DUPLICATING MACHINES

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Application August 1, 1951, Serial No. 239,720

4 Claims. (Cl. 101—425)

This invention relates to rotary duplicating machines, and more particularly, to means for cleaning and removing the ink from the printing surfaces of such machines.

The present invention is especially applicable to machines adapted for offset printing where ink impressions are transferred from an inked printing plate onto a blanket cylinder which does the actual printing on the paper. Thereafter, when a new printing plate is to be substituted, it is obvious that the blanket cylinder has to be carefully cleaned to remove all of the old ink impressions prior to the transfer thereto of the ink impressions of the new printing plate. In addition, it is sometimes desirable to clean the blanket cylinder when there is an excessive accumulation of dirt and foreign matter in order to insure the production of clean, sharp copy.

Heretofore, it has been customary to clean the blanket cylinder by hand with a cloth or rag saturated with cleaning solution. In addition to the general inconvenience of cleaning by hand, the blanket cylinders of such machines are frequently relatively inaccessible, especially when equipped with feeding attachments. The various obstructions that have to be contended with make it difficult to do a thorough job of cleaning. Also, of course, storage of the cleaning material near at hand is required.

A few devices for cleaning printing surfaces have been heretofore proposed, but they have been unsatisfactory for one reason or another, generally because they have been unduly complicated and expensive.

In accordance with the present invention, the cleaning equipment is built into the machine and can be conveniently and quickly operated by a hand lever. The cleaning job is much more thorough and far superior to hand cleaning, and the mechanism is simple, easy to manufacture and inexpensive. Furthermore, the actual cleaning parts are enclosed so that the annoying penetrating odors characteristic of many of the cleaning solutions are greatly reduced in effect. As an additional feature, the supply of cleaning solution is regularly replenished to the actual cleaning parts each time the hand lever is operated.

The advantages of the present invention are particularly apparent when a plurality of short runs is to be performed, that is to say, when only a limited number of copies from each printing plate is desired. For example, on some machines which are in almost constant use, printing plates are sometimes changed as often as 600 times a day; thus 600 cleanings are required. The present invention makes possible savings in time spent in cleaning especially as compared to cleaning by hand, therefore, a greater proportion of the operating time of the machine can be directed to printing and a greater number of runs performed in a given period of time.

These and other improvements will be more fully shown and described in the accompanying drawings and the detailed description which follows:

Referring to the drawings—

Fig. 1 is a side elevation, partly in section, of a portion of a duplicating machine equipped with the present invention.

Fig. 2 is a top plan view of the blanket cylinder with parts of the present invention attached.

Fig. 3 is a perspective view generally of the parts shown in Fig. 2.

The present invention is shown and described in connection and as applied to a duplicating machine of the

type disclosed in United States Patent No. 2,387,750 to W. W. Davidson. The machine comprises generally two cylinders 1 and 2 arranged in tangential relationship, the former being twice the size of the latter. The machine is capable of doing both direct and offset printing, and, for a complete understanding of its operation, reference can be had to the above cited patent. When used for direct printing, the large cylinder 1 carries type which prints directly onto the paper passing between the cylinders, the small cylinder acting only as an impression cylinder against which the paper is printed. Since the small cylinder is not inked under these conditions, no cleaning is required when the type is changed. When used for offset printing, however, the small cylinder acts as a blanket, receiving the ink impressions from a plate segment of the larger cylinder and printing directly onto the paper against a platen segment of the large cylinder. When, therefore, the printing plate is to be changed, the smaller blanket cylinder has to be cleaned before receiving the ink impressions from the new plate. Such is the function of the present invention in the embodiment shown and described herein.

Referring to the drawings, the printing cylinders 1, 2 are rotatably supported on shafts 1*a*, 2*a*, respectively, mounted in side frames A of the machine. When used in offset printing, the large cylinder 1 is composed of a plate segment and a platen segment (not shown). The smaller cylinder 2 is usually covered with rubber.

The cylinders are driven from a single driving source through a chain and sprocket drive. Accordingly, the lower shaft 2*a* is provided with a pair of sprockets 3 positioned outboard of the blanket cylinder 2 at the extremities of the shaft, and rotation is imparted thereto by a pair of driving chains 4. The shaft 2*a* is also provided with a gear 5 which serves to transmit rotation to the large cylinder through a gear 6 mounted on the shaft 1*a*.

In printing, the plate is inked through a series of rolls (not shown) and the ink impressions are transferred from the plate segment to the blanket cylinder. The sheets of paper are fed between the cylinders and printed from the blanket and against the platen segment of the large cylinder. The sheets are thereupon delived to a receptacle by a gripper bar (not shown) carried by the chains 4 where they are neatly stacked.

The machine, as well as the operation thereof, as thus far described, is standard and forms no part of the present invention; the cited patent may be referred to for a more complete understanding.

It is evident that if a new printing plate is to be substituted, it is necessary to remove the ink impressions of the old plate from the blanket cylinder 2. It may also be desirable to clean the blanket cylinder when there is an excessive accumulation of dirt and foreign matter in order to insure the production of a clean and sharp copy. Toward this end, a long sponge wiper 7, saturated with cleaning solution, is adapted to be pivoted into operative cleaning contact with the surface or periphery of the blanket cylinder 2 by the operation of the hand lever 8. Although the type of wiper is not deemed especially significant, cellulose sponges have been observed to withstand the commercial solvents, such as carbon tetrachloride and petroleum solvents, very well. The sponge is attached to a backing or stiffening member 9, which, in turn, is supported from a pivoted shaft 10 by means of supporting brackets 11. The sponge, of course, should be removable in the event it becomes necessary to replace it. The shaft is supported in bearings, at either end, in a housing 12, and the shaft is prevented from endwise or axial displacement by end collars 13. The housing serves to enclose the sponge wiper, without interfering with its pivotal operation against the blanket cylinder, and the strong odors of the cleaning solution are thereby somewhat confined. In order that the housing may be positioned very closely to the blanket cylinder, the side walls of the housing are arcuately shaped in the general form of the cylinder. The housing is supported on cross-members 14 which are mounted to the side frames A of the machine.

The operation of the wiper 7 toward and away from the surface of the blanket is controlled by the hand lever

8 which is connected to the shaft 10. In the normal inactive position, the wiper is positioned away from the blanket, the brackets 11 resting against stops 15 (see Fig. 1) attached to the interior of the housing. As the handle 8 is lifted to the position indicated by broken lines in Fig. 1, the sponge wiper is pivoted into active engagement with the surface of the blanket cylinder 2, which is thereby wiped clean. The used solution, containing the ink and dirt, may be collected in a receptacle and drained off whenever desired.

In order that the supply of cleaning solution may be regularly replenished to the wiper, the solution is stored in a container or bottle 16. The lower or discharge end of the container 16 is connected to a valve housing 17 which, in turn, is mounted to one of the side frames A of the machine by a bracket 18, and the valve housing is connected by a hose or tube 19 to a horizontal pipe 20, plugged at both ends and supported endwise within the wiper housing 12. The pipe 20 is positioned in the housing 12 above the wiper 7, and the bottom of the pipe is perforated to permit the flow of the cleaning solution, at regulated times, to the sponge wiper.

A spring pressed valve 21 within the valve housing 17 serves to normally prevent the flow of the solution to the wiper. The interior of the housing 17 is shaped to form a seat for the valve. The valve is provided with a downwardly depending stem 21*a* to which an annular disk or collar 21*b* is fastened, and the spring, a compression type acting against the disk 21, normally urges the valve downwardly against the seat to prevent flow.

The valves 21 may be lifted to permit the flow of the cleaning solution to the wiper by the operation of the hand lever 8. The operation of the valve 21 is controlled by the vertical movement of a bent push rod 22. The push rod is shown supported at its upper end to the bracket 18 and at its lower end to one of the frames A. The upper end of the push rod is provided with an arm or finger 22*a* which projects into the housing 17 through a vertical slot 17*a* and engages the lower end of the valve stem 21*a*, thereby controlling the operation of the valve. The lower end of the push rod falls in the path of travel of the hand lever 8. When, therefore, the hand lever is raised to bring the sponge into wiping contact with the blanket cylinder, the push rod 22 will be moved upwardly, permitting the projecting arm 22*a* to overcome the force of the spring and to lift the valve off its seat. While the hand lever is thus raised, the cleaning solution will be permitted to flow through the hose 19 to the perforated pipe 20 from which it will be evenly dispensed onto the sponge. Upon the return of the hand lever to normal or inactive position, the valve will automatically close under the spring pressure to cut off the flow of the cleaning solution.

The sponge, if one is employed as the wiper, can be washed out from time to time. Also, if the machine is not in regular operation and the sponge dries out, the sponge should be softened with water before use, inasmuch as the commercial solvents are not very effective as softeners. In addition, it has been found that the water serves to repel the greasy ink to some degree, so that less frequent cleaning of the sponge is required.

The invention has been shown in preferred form and as applied to a machine of the type described, but it is applicable as well to other related uses and to other machines. Obviously, many modifications and variations may be made therein and in its mode of application without departing from the spirit of the invention; it is to be understood, therefore, that the invention is not to be limited to any specific form or embodiment, except insofar as such limitations are specified in the appended claims.

The invention being thus described, what is claimed is:

1. A device for cleaning inked surfaces of rotary printing machines having a blanket cylinder, said device comprising a wiping member pivotally movable into and out of operative contact with the surface to be cleaned, a container for storing the cleaning solution, a conduit, one end of which is connected to the container and the other end of which is adjacent the wiping member to direct the flow of cleaning solution therebetween, a normally closed spring urged valve located in said conduit between said container and said wiping member for preventing the flow of the solution through the conduit, a vertically disposed rod movable to engage and open the valve, and a hand lever for controlling the pivotal movement of the wiping member toward and away from the surface of the cylinder, said hand lever engaging said rod and serving to open the valve when actuated to wiping position.

2. A device for cleaning inked surfaces of rotary printing machines having a machine frame and a rotatable cylinder mounted in the machine frame, said device comprising a wiping member movable into and out of operative contact with the surface of said rotatable cylinder, a container mounted to the machine frame for storing the cleaning solution, a perforated conduit spacially separated from the movable wiping member but in close proximity thereto connected at its upper end to the container, said conduit serving to direct the fluid from the container and to distribute it upon the wiping member, a normally closed spring-urged valve in said conduit for preventing the flow of fluid therein, a rod mounted for vertical movement in guides in the machine frame, said rod being operable to open the valve, the rod being normally in inoperative position, and a hand lever for controlling the movement of the wiping member toward and away from the surface of the cylinder to be cleaned, said hand lever also engaging and actuating the rod to open the valve.

3. A device for cleaning inked surfaces of rotary printing machines having a rotatable blanket cylinder, said device comprising a wiping member movable into and out of operative contact with the rotatable blanket cylinder, a conduit leading from the container, the lower end of the conduit having perforations in close proximity to the wiping member, a normally closed spring-urged valve for preventing the flow of the solution through the conduit, a hand lever for controlling the movement of the wiping member toward and away from the surface to be cleaned, a movable rod controlled by the hand lever adapted to open the valve and permit the flow of the solution to the wiping member when the hand lever is actuated to operative position, and permitting the valve to close when the hand lever is returned to inoperative position, and an enclosure for the wiping member, which enclosure serves both as a receptacle to collect any falling solution and to reduce the effects of the odor of the solution, said enclosure having an opening therein to permit the wiping member to contact the surface to be cleaned.

4. A device for cleaning an inked blanket cylinder of a rotary printing machine, said device comprising an enclosed housing adjacent the blanket cylinder to be cleaned, a rotary shaft supported between the side walls of the housing, a wiper carried by said shaft, the housing having a slot therein to permit the wiper to be moved into operative contact with the blanket cylinder, a container for storing the cleaning solution, a conduit, one end of which is connected to the container and the other end of which is adjacent the wiper for permitting the flow of the solution from the container to the wiper, a normally closed valve in said conduit for preventing flow therethrough, a hand lever for controlling the movement of the wiping member toward and away from the surface of the cylinder, and a connecting linkage between the hand lever and the normally closed valve to open the valve when the hand lever is operated to bring the wiping member into engagement with the surface of the cylinder.

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