M. J. BULGER.

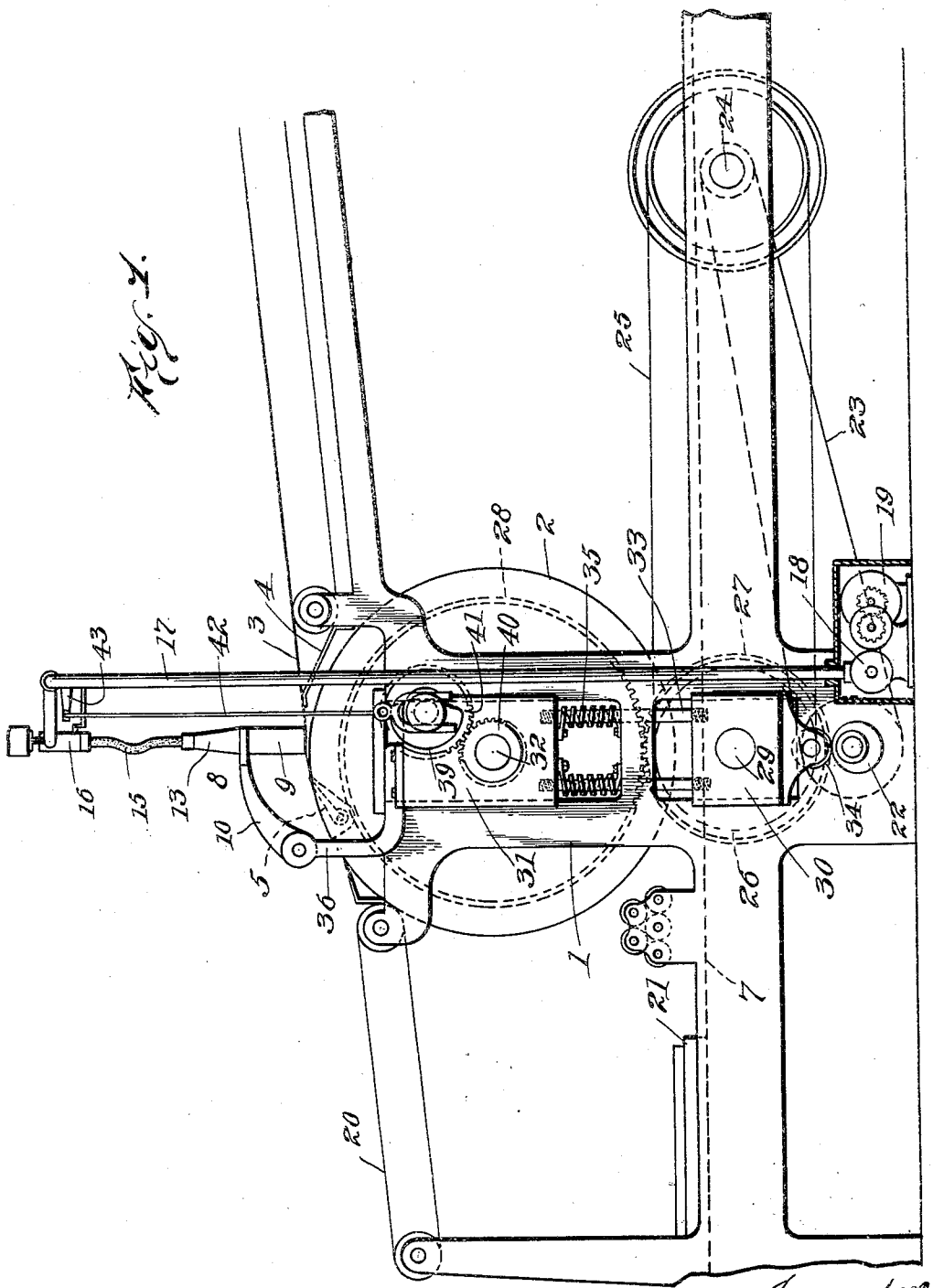
CLEANER DEVICE.

APPLICATION FILED JULY 17, 1913.

1,094,364.

Patented Apr. 21, 1914.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

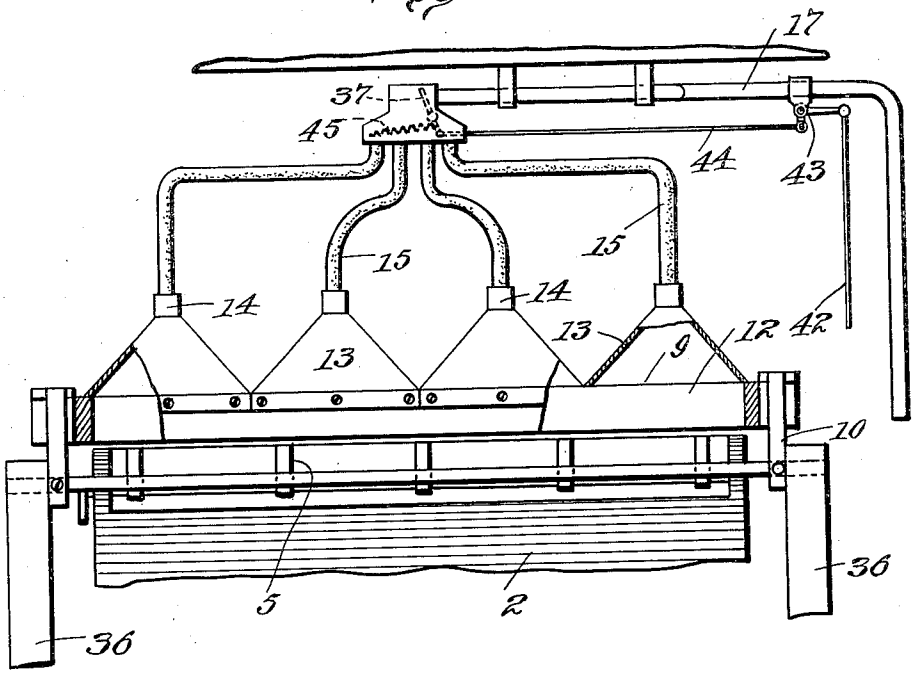


Fig. 3.

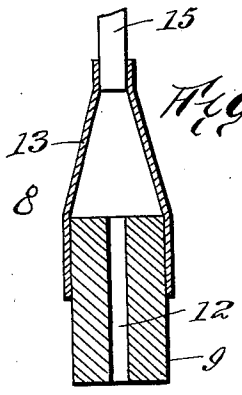
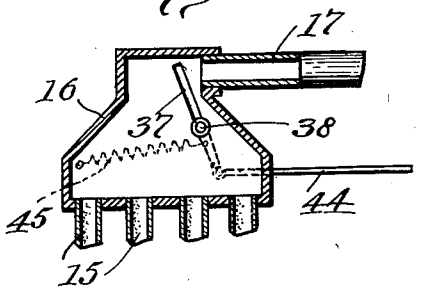


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CLEANER DEVICE.

1,094,364. Specification of Letters Patent. Patented Apr. 21, 1914.

Continuation of application Serial No. 700,397, filed May 29, 1912. This application filed July 17, 1913. Serial No. 779,644.

To all whom it may concern:

Be it known that I, MATTHEW J. BULGER, a citizen of the United States, residing at East Seventy-second street, Brooklyn, New York, have invented certain new and useful Improvements in Cleaner Devices, of which the following is a clear, full, and exact description.

This invention relates to a device for cleaning the surface of articles such as sheets of paper.

The invention is particularly useful when applied as an attachment for a printing press in order to clean the sheets which are to be printed upon. The device removes small particles of dust, lint or paper which adhere to the surface of the paper and may tend to cause blurring of the impression of the type, and producing imperfections in the printed sheet. It is also desirable to remove this dust for the reason that it accumulates on the working parts of the machine and tends to clog them and in that way interfere with their effective operation.

One of the objects of the invention is to produce a cleaner device which is very simple in its construction and operation and which will operate very efficiently for the general purposes outlined above, or in other situations.

This application Serial No. 779,644 is a continuing application with my former application Serial No. 700,397.

Although the invention is susceptible of use in many connections, one of my special objects is to adapt it to the peculiar requirements of a printing press.

Further objects and advantages of my improved device will become apparent in the particular description following, and it is understood that many variations of the preferred construction herein shown and described may be made without departing from the scope of my invention as defined in the appended claims.

In the preferred embodiment of my invention shown in the drawings, Figure 1 is a side elevation illustrating the invention applied to a printing press; Fig. 2 is a front elevation showing the upper part of the press and showing my improvement partly in section; Fig. 3 is a vertical transverse section through the cleaner; and Fig. 4 is a vertical section through a receiver through which a partial vacuum is induced in the brush or cleaner, and illustrating details.

Referring more particularly to the parts, 1 represents the frame of a machine such as a printing press to which the invention is applied, and in this frame a rotary impression cylinder 2 is mounted so as to receive the unprinted sheet 3 which may be fed to its upper surface over a guide 4. The cylinder may be provided with the usual gripper 5 which seizes the sheet, and as the cylinder rotates presents it to a bed 21 carrying the type, and which may travel on a track 7 passing under the cylinder.

My attachment 8 preferably comprises a cleaner or air brush 9 which is arranged in such a way as to clean the paper before it is printed upon. It may be disposed near the path of the paper sheet as it passes onto the cylinder, and the cleaner may be supported on arms 10 or in any other suitable manner.

In the preferred embodiment of my invention the cleaner or pneumatic brush 9 is in the form of a suction head consisting of an elongated bar which extends transversely of the cylinder. This bar may be formed so as to present a longitudinal slot 12 extending from its lower face to its upper face. Preferably on the upper side of this cleaner body or bar, I attach a plurality of hoods 13 which may have outlet nipples 14 connected respectively with a plurality of tubes or hose 15 which lead to a receiver or manifold 16. By reason of the fact that I provide a plurality of the hoods 13 with separate hose connections thereto, the air is drawn off with a substantially uniform suction effect throughout the entire length of the slot.

The receiver 16 may be connected by pipe 17 with an air pump 18 or similar device for withdrawing the air from the receiver in order to induce an inward flowing air current through the air brush or cleaner body 9. This air pump 18 may be driven by any suitable means such as the motor 19. As the sheet 3 passes onto the cylinder 2 it moves across and adjacent the slot 12, and the induced air current passing into the slot removes the dust or dirt on the paper and carries the dirt up through the exhaust apparatus.

In the type of printing press illustrated, at each alternate rotation of the cylinder, the cylinder receives the sheet 3 to be print-

ed and at every other rotation of the cylinder the printed sheet is delivered upon the delivery table such as an endless belt 20. In the form of press illustrated, the printing type or plates are carried on the slide or bed which passes to and fro under the cylinder. In the forward movement of the bed 21 the printing impression is given to the paper and on the return movement the cylinder 2 is elevated so as to be held out of contact with the type. In this way the surface of the cylinder is kept clean. In the printing press illustrated this up and down movement of the cylinder is effected by means of an eccentric 22 which may be driven by means of a belt 23 from a countershaft 24. The rotary motion of the cylinder may be effected from the same countershaft through the medium of a belt 25 driving a pulley 26 and a pinion 27 which meshes with a gear wheel 28 rigid with the cylinder 2. The shaft 29 which carries the pinion 27 is mounted in a slide block 30 and a similar slide block 31 carries the shaft 32 of the cylinder 2. These blocks are connected rigidly together by vertical rods 33. A roller 34 under the block 30 is in contact with the cam 22 so that at each rotation of the cam the block 30 rises and also raises the cylinder. The lifted parts tend to return by gravity, but the action of gravity is assisted by means of tension springs 35 which may be placed around the rods 33. My cleaner 8 is preferably mounted on brackets 36 which may be attached to the upper block 31 so that the cleaner rises and falls with the cylinder.

A partial vacuum may be constantly induced in the pneumatic cleaner, but when applied to such a press it will be evident that the cleaner is only actually cleaning a sheet on every alternate rotation of the cylinder. Hence if desired, in order to effect a saving in the work necessary to cause the suction, I may provide means for regulating the induced air current in such a way that the air current is induced only at the moment that a sheet is passing the pneumatic brush 9. In order to accomplish this I prefer to provide a damper 37 which may be movably mounted in any suitable manner such as upon a pivot 38 in the receiver 16 and arranged so that it may close the outlet from the receiver into the pipe 17. This damper is preferably controlled automatically from some moving part of the machine. This may be accomplished by means of a cam 39 which is rotatably mounted on the block 31 and which may be driven directly from the shaft 32 by means of gear wheels 40 and 41. This cam may be arranged to operate the link 42 which connects through a bell-crank lever 43 and link 44 with the damper. A spring 45 may be utilized to close the damper when it is not held open by the cam. The gears 40 and 41 are proportioned so that the damper is closed not at each revolution, but at every other revolution of the cylinder. In this way the cam 39 operates to open the damper periodically and just at the moment when the sheet 3 is passing, and of course it should hold the damper open until the sheet 3 has completely passed the brush. The slot 12 is long and narrow so that a good suction effect is produced, and as the slot extends transversely of the sheet of paper, it will operate to remove the dust from the sheet through its entire width. As the atmosphere of the press-room is full of dust, it is desirable to locate the cleaner in close proximity to the press.

Special attention is called to the fact that the dust or dirt is removed solely by the action of the suction. Therefore the action of the cleaner is superior to that of cleaners which have mechanical means, such as a brush engaging the paper, because such a mechanical brush may tend to throw the paper to one side if the cleaner is located near the feeding point and thus might interfere with the efficient operation of the grippers or other means for holding the sheet on the cylinder.

What I claim is:

1. In a printing press in combination, a rotary cylinder having a sheet of paper traveling therewith, a paper-cleaning device having a long narrow suction slot extending transversely of said paper sheet, means for producing a suction effect of sufficient intensity through said slot to remove the dust and loose particles of paper from said sheet solely by said suction effect, and means for drawing said paper sheet past the edges of said suction slot and around with said cylinder.

2. In a printing press in combination, a rotary cylinder having a sheet of paper traveling therewith, a paper cleaning device mounted adjacent said cylinder having a long, narrow suction slot extending transversely of said paper sheet and in close proximity to said cylinder, means for producing a suction effect of sufficient intensity through said slot to remove the dust and loose particles of paper from said sheet solely by said suction effect, and means for drawing said paper sheet past the edges of said suction slot and around with said cylinder.

3. In a printing press in combination, a rotary cylinder having a sheet of paper traveling therewith, a paper cleaning device mounted adjacent said cylinder having a long, narrow suction slot extending transversely of said paper sheet and in close proximity to said cylinder, means for producing a suction effect of sufficient intensity through said slot to remove the dust and

loose particles of paper from said sheet solely by said suction effect, and paper grippers carried on said cylinder for drawing said paper sheet past the edges of said suction slot and around with said cylinder.

4. A printing press having means for moving and guiding the sheet to be printed, a cleaner consisting of a suction head for removing dust from the sheet extending across the path of the said sheet, and means for inducing through said head a suction effect of sufficient intensity to remove the dust and loose particles on the sheet without stopping the travel of said sheet, said head being devoid of other mechanical means for removing the dust, and automatic means for regulating the induced air current.

5. A printing press having means for moving and guiding the sheet to be printed, a cleaner consisting solely of a suction head for removing dust from the sheet extending across the path of the said sheet, means for inducing through said head a suction effect of sufficient intensity to remove the dust and loose particles without stopping the travel of said sheet, said head being devoid of other mechanical means for removing the dust, and means for temporarily arresting the suction effect when the sheet is being delivered from the press.

6. A printing press having means for moving and guiding the sheet to be printed, a cleaner consisting solely of a suction head for removing dust from the sheet extending across the path of the said sheet, means for inducing through said head a suction effect of sufficient intensity to remove the dust and loose particles without stopping the travel of said sheet, said head being devoid of other mechanical means for removing the dust, means for temporarily stopping the suction effect when the sheet is being delivered from the press including a damper, and automatic means for controlling the operation of said damper.

7. A press having a rotary cylinder adapted to receive a sheet to print the same, a pneumatic cleaner adjacent said cylinder and near the path of said sheet as it passes to said cylinder, means for inducing through said cleaner a suction effect of sufficient intensity to remove the dust and loose particles without stopping the travel of said sheet, and automatic means for temporarily arresting the suction effect periodically.

8. A press having a rotary cylinder adapted to receive a sheet to print upon the same, a pneumatic cleaner adjacent said cylinder and near the path of said sheet as it passes to said cylinder, means for inducing through said cleaner a suction effect of sufficient intensity to remove the dust and loose particles without stopping the travel of said sheet, and automatic means for temporarily arresting the suction effect upon the alternate revolutions of said cylinder.

Signed at New York city, N. Y., this 10th day of July, 1913.

MATTHEW J. BULGER.

Witnesses:

GEO. F. GROOME,

GEORGE THOMAS DORAN.