J. E. DOYLE & F. M. CASE.

SUCTION NOZZLE ATTACHMENT FOR PRINTING PRESSES.

APPLICATION FILED SEPT. 29, 1914.

1,196,438.

Patented Aug. 29, 1916.

2 SHEETS—SHEET 1.

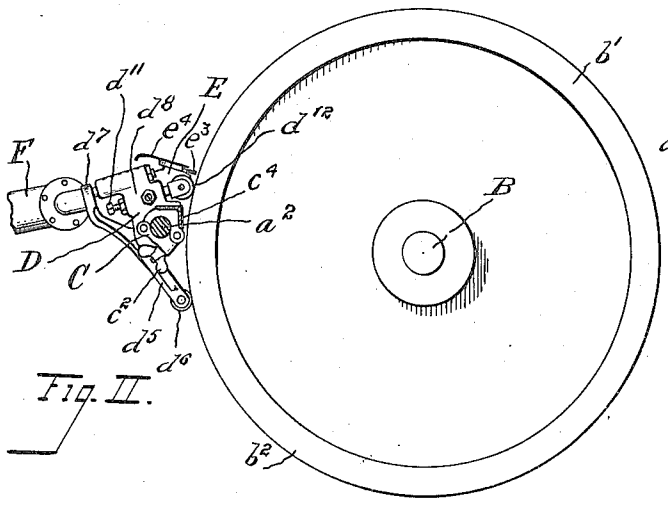


Fig. II.

Fig. I.

Witnesses:
Herman Esele
Marie Wagner.

Inventors:
James E. Doyle
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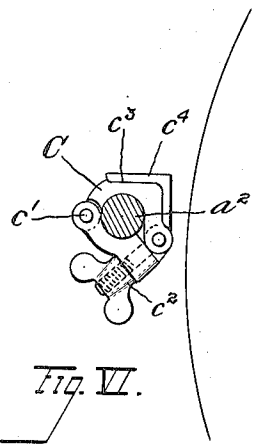


Fig. VI.

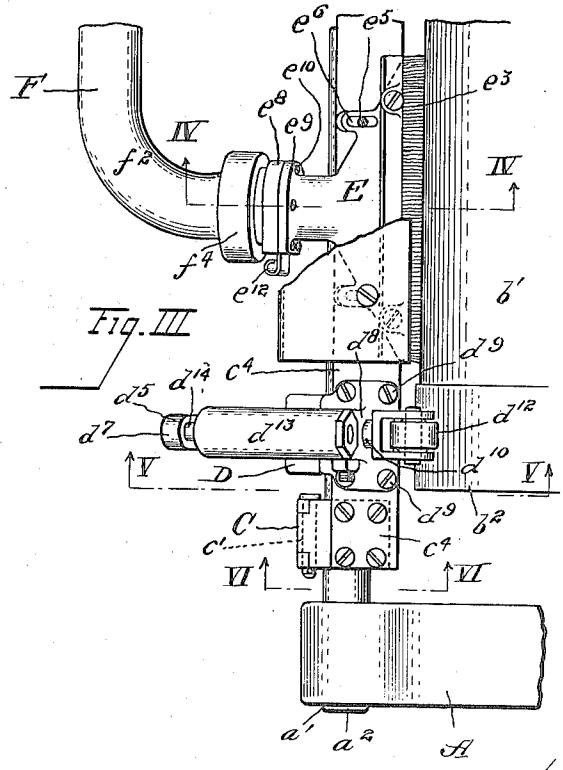


Fig. III.

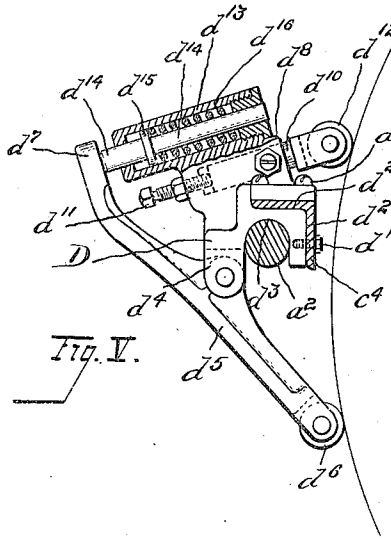


Fig. V.

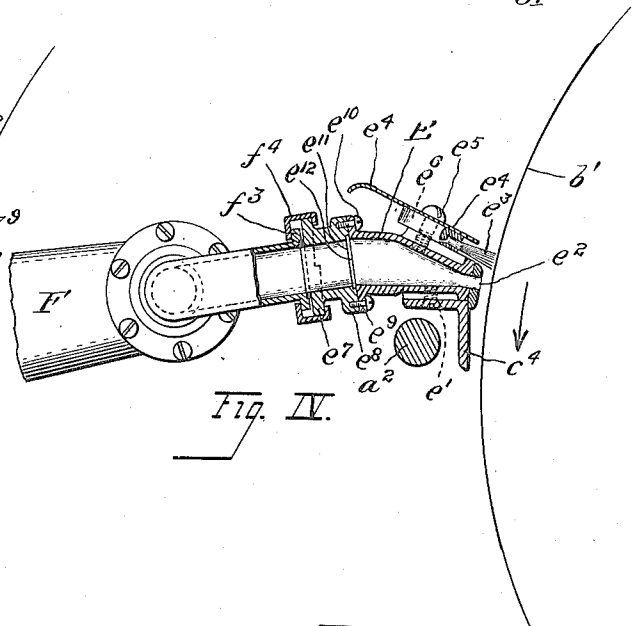


Fig. IV.

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UNITED STATES PATENT OFFICE.

JAMES E. DOYLE AND FRANCIS M. CASE, OF CLEVELAND, OHIO; SAID CASE ASSIGNOR TO CHARLES S. BRITTON, OF CLEVELAND, OHIO.

SUCTION-NOZZLE ATTACHMENT FOR PRINTING-PRESSES.

1,196,438. Specification of Letters Patent. Patented Aug. 29, 1916.

Application filed September 29, 1914. Serial No. 864,030.

To all whom it may concern:

Be it known that we, JAMES E. DOYLE and FRANCIS M. CASE, both citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Suction-Nozzle Attachments for Printing-Presses, of which the following is a specification, the principle of the invention being herein explained and the best mode in which we have contemplated applying that principle, so as to distinguish it from other inventions.

Our attachment has general reference to a suction contrivance adapted for use in conjunction with a printing press and purposed to cleanse a passing sheet preparatory to printing thereon.

The improvement which is claimed to be new is more particularly associated with a manifold, a plurality of nozzles in connection therewith, together with the mode of effecting such connection and supporting the whole in operative proximity to the press.

The objects of the attachment other than to assure an efficient and reasonably economical manufacture are: Facility of disassemblage of certain parts for the purpose either of cleansing, repair or replacement. Flexibility of mounting to compensate automatically for relative movement incident to the coöperating functions of certain other parts.

Our inventive conception is associated with means which are hereinafter explained and variously combined in the claims.

The annexed drawings and particular description thereof together set forth in detail one specific means embodying our invention, such disclosed means, however, only exemplifying one of various mechanical forms with which the principle of our invention may be applied.

Figure I is a plan view showing our suction-nozzle attachment mounted upon a standard cylinder press and in further operative connection with a suction-fan motor comprising the subject matter of another application filed of even date herewith. Fig. II is a vertical section on line II—II of Fig. I. Fig. III is an enlarged plan of an end of Fig. I. Fig. IV is mainly a section on line IV—IV of Fig. III. Fig. V is a section on line V—V of Fig. III looking in the direction of the arrows, one detail not intersected by such line being moreover also represented in section. Fig. VI is a parallel section on line VI—VI of Fig. III.

Adverting first to Fig. I wherein only so much of the press frame and cylinder are shown as is necessary for the purposes in hand, one notices that the former carries at opposite ends a pair of bearings a' in which a rod a^2 is mounted for movement. A shaft B supports the cylindrical drum b' which serves as the sheet conveyer and the ends of each are formed as rims b^2.

Inclosing opposite ends of the rod a^2 are a pair of clamps C. Each of the clamps C comprises a pair of complementary members hinged at c', and adapted to have their extremities secured to each other by means of a thumb nut combination c^2 as best shown in Figs. III and VI. When fixedly secured to the rod a^2, the clamps C are necessarily enabled to oscillate therewith, as will be later explained. The two upper portions of the two clamps C present two angularly related surfaces c^3 between which an angle c^4 extends and against which it rests. The angle c^4 extends therefore, along the entire line of the cylinder b'.

A pair of brackets D of peculiar formation are interposed between the rod a^2 and angle c^4 inwardly adjacent the clamps C respectively. They are secured to the angle c^4 by means of screws d', as clearly shown in Fig. V, such that two outer surfaces d^2 of the brackets D conform with the two angular surfaces of the angle c^4. Underneath the brackets D are formed with semicircular bearings d^3 whereby they may be rocked upon the bar a^2 when the angle c^4 is oscillated thereupon as has been earlier stated. The brackets D are provided with depending outwardly disposed portions d^4 in which a pair of levers d^5 are pivoted intermediately of the ends thereof. The lower extremities of each of the levers d^5 carries a roller d^6 adapted to contact the rims b^2. Whereas the upper extremities d^7 of the levers d^5 are slightly curved to pro-

ject upwardly a slight distance beyond the angle c^4. Fitted to the outer upper portions of the brackets D and overlying also the top of the angle c^4 are a pair of members d^8, and these are secured to the top surface of the angle c^4 by means of screws d^9. The lower portions of the members d^8 are provided with an inclined cylindrical opening into which a bar d^{10} extends to be controlled by means of set screws d^{11} extending from the other ends. The bars d^{10} carry on their outer extremities rollers d^{12} also adapted to engage the rims d^2 respectively. Above, the members d^8 are fashioned as tubular portions d^{13}, having an opening in both ends through which a plunger d^{14} is adapted, in each instance, to move. These plungers carry interiorly of the portions d^{13}, collars d^{15} adapted to compress inclosed springs d^{16} against the opposite ends. The plungers d^{14} are so arranged as to lie in the path of movement of the upper extremities d^7 of the levers d^5, such that a yielding engagement therebetween is effected, as clearly exemplified in Fig. V. It is apparent, in view of the foregoing, that each pair of rollers d^6 and d^{12} is held in yielding engagement with the proximiate rim b^2 of the cylinder through the agency of the same flexible element and in a manner to permit of a compensatory movement on the part of either in response to any independent movement of the cylinder. During any movement of the rollers d^6 other than rotatory, the upper extremities of the levers d^5 move a corresponding distance without movement of the brackets D. When on the other hand the two rollers d^{12} are moved other than in a rotatory manner, the brackets D will rock about the rod a^2 as a pivot and likewise against the action of the spring d^{16}.

A plurality of nozzles E provided with flared inlets are secured to the top of the angle c^4 by means of screws e'. These nozzles are alined across the entire width of the cylinder such that their inlet slots e^2 are alined to form together a narrow series of slots. Each of the nozzles E carries above, or in advance of the slots e^2 with reference to the direction of movement of the cylinder indicated in Fig. IV, a brush e^3 adapted to contact the paper sheet which is being carried past by the cylinder. These brushes while helpful are not indispensable. Also carried upon each of the nozzles E and extending across the entire width, there is a dust guard or diverting plate e^4, and these guards are each adjustable relative to the cylinder by means of screws e^5 which pass through suitable slots in such nozzles. The purpose of the guards e^4 is to direct settling dust toward the nozzle inlets and to this end they should be adjusted as closely to the cylinder as is feasible. The other or outlet ends of the nozzles are flanged, and such flanges are provided with tongues e^7, as shown in Fig. IV. Intermediately of the inlet slots e^2 and flanged tongues e^7, the nozzles E are made separable by means of a pair of flanges e^8 and e^9 suitably secured together by means of screws e^{10}. The flanges e^8 are each provided with a recess e^{11}, opening out at one side and intended for the reception of a slide e^{12} adapted to serve the function of a damper.

A manifold F, having a plurality of inlets corresponding in number with and spaced as the nozzle outlets, is provided with a suction fan motor designated entirely as f'. The structure of the motor f' comprises the subject matter of a separate application filed by Francis M. Case of even date herewith, and for the purpose in hand to be inferred as capable of creating a strong suction effect through the manifold F. The several inlets f^2 of the manifold, are each provided with a flanged extremity f^3 meant to be tightly drawn, along with, an interposed gasket, against the tongues e^7 by means of couplings f^4 which are adapted to engage and to be disengaged from the tongues e^7. In this way the manifold F may be quickly disassembled from the nozzles E.

Our invention commends itself primarily because of features of localized adjustment, and disassembling facilities. A few details of construction have been found to contribute to reliability and efficiency during use. It is manifest that by merely loosening the clamps C and the couplings f^4, all the nozzles together with their supporting mechanism may be lifted and removed from the press. The dust guards e^4 are purposed to divert and conduct dust toward the nozzle's inlets whereby the greatest measure of loose particles may be drawn away from the sheet conveyer as a whole. The provision of a plurality of dampers corresponding in number with the number of nozzles, makes it possible to effect an independent control of the induced flow through each nozzle to suit the varying conditions that may arise.

We claim:

1. In an attachment of the character described, the combination with a sheet conveyer: of a suction nozzle disposed adjacent the same, and supporting mechanism for said nozzle and including a pair of flexibly connected members yieldingly engaging said conveyer.

2. In an attachment of the character described, the combination with a sheet conveyer: of a bar pivotally mounted adjacent the same, mechanism upon said bar and including an independently tiltable member having one end in yielding engagement with said conveyer, and a suction nozzle carried by said mechanism.

3. In an attachment of the character described, the combination of a sheet conveyer,

a suction nozzle supported adjacent thereto, and a diverting plate carried above upon said nozzle and downwardly inclined toward the intake thereof and toward said conveyer.

4. In an attachment of the character described, the combination of a sheet conveyer, a suction nozzle supported adjacent thereto, and a diverting plate carried upon said nozzle, said plate being adjustable relative to said conveyer.

5. In an attachment of the character described, the combination of a sheet conveyer movable as a unit, a supporting member mounted for distinct movement relative to said conveyer and extending across the width thereof, means actuated by the movement of said conveyer in one direction for effecting the movement of said supporting member in a different direction, a plurality of nozzles attached to said member, a manifold removably connected with said nozzles, and suction means operatively connected with said manifold.

6. In an attachment of the character described, the combination of a sheet conveyer, a bar pivotally mounted adjacent thereto, a pair of brackets upon opposite ends of said bar respectively and carrying each a roller in engagement with said conveyer, a plunger yieldingly mounted upon said bracket, a lever fulcrumed upon each of said brackets and carrying a roller in engagement with said conveyer some distance removed from said first mentioned roller, the opposite ends of said levers adapted to engage said plunger whereby to equalize the pressure upon said rollers.

7. In an attachment of the character described, the combination of a sheet conveyer, a support extending along said conveyer, a pair of clamps detachably mounted upon said support near opposite ends of said conveyer, a member carried by said clamps, a plurality of nozzles carried by said member and having inlet openings extending across said conveyer, a manifold detachably connected with the outlets of each of said nozzles, whereby all of said nozzles may be removed as a unit when detached from the support and manifold.

8. In an attachment of the character described, the combination of an impression drum adapted to rise and fall, a rod extending across the same, a bracket adapted to rock thereon, a supporting member mounted upon said bracket, a plurality of nozzles detachably mounted upon said member, suction means operatively connected with said nozzles, and a pair of members carried by said bracket and reactingly engaging said drum above and below said nozzles respectively.

9. In an attachment of the character described, the combination with a sheet conveyer: of a manifold, suction means in communication therewith, a plurality of nozzles, couplings detachably connecting said manifold inlets and nozzle outlets, the latter being provided each with an open recess, and slides movable in said recesses whereby to serve as individual dampers.

10. In an attachment of the character described, the combination with a sheet conveyer: of a manifold, suction means in communication therewith, a plurality of alined nozzles connected to said manifold, and dust diverting plates surmounted upon said nozzles and abutting each other, said plates being downwardly inclined in a direction toward said conveyer for the purpose specified.

11. In an attachment of the character described, the combination with a sheet conveyer, of a member extending along the same and movable with respect thereto, an appliance carried upon said member and including a part in engagement with said conveyer, and a suction nozzle carried by said appliance.

12. In an attachment of the character described, the combination with a cylindrical impression drum adapted to rise and fall, of a movable support extending along the same, mechanism carried by said support and including a member in engagement with said drum whereby to rock said support, suction nozzles mounted upon said mechanism and having their mouths opposed to said drum, a manifold connected with said nozzles, and suction means connected with said manifold.

13. In an attachment of the character described, the combination of an impression drum adapted to rise and fall, a pivotally mounted rod, a member detachably mounted upon said rod adjacent said conveyer, a plurality of nozzles carried by said member and having inlet openings extending across said conveyer, a manifold detachably connected with the outlets of said nozzles, and means secured to said member and movably secured to said rod, said means including an extension engaging said drum whereby to rock said rod and nozzles.

14. In an attachment of the character described, the combination of an impression drum, a pair of brackets mounted for concerted movement adjacent the same, a support carried by said brackets and extending across said drum, a plurality of nozzles mounted upon said support, suction means operatively connected with said nozzles, and means carried by said support and adapted reactingly to engage said drum, whereby to determine the proximity of said nozzles thereto.

15. In an attachment of the character described, the combination of an impression drum adapted to rise and fall, a rod piv-

otally mounted adjacent said drum, a support secured to said rod, a plurality of nozzles carried by said support, a manifold connected with said nozzles, suction means connected with said manifold and means yieldingly connecting said drum and support and adapted to rock said nozzles upon said rod.

Signed by us, this 12th day of Sept., 1914.

JAMES E. DOYLE.
FRANCIS M. CASE.

Attested by—
B. W. BROCKETT,
MARIE WAGNER.