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2,114,723

SURFACE TREATING APPARATUS

Filed July 15, 1936

2 Sheets-Sheet 1

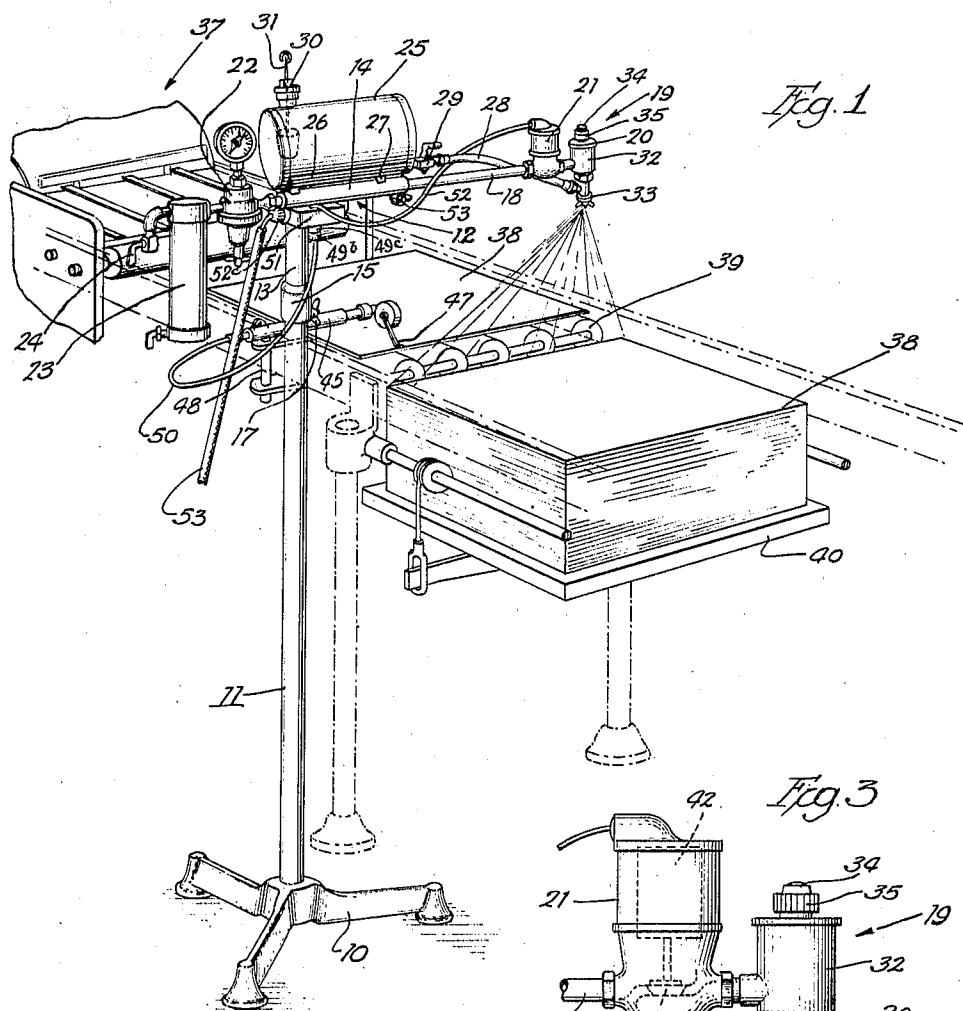


Fig. 1

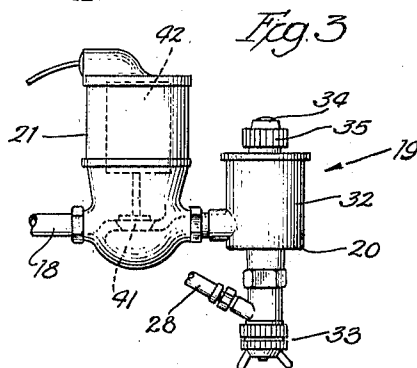


Fig. 3

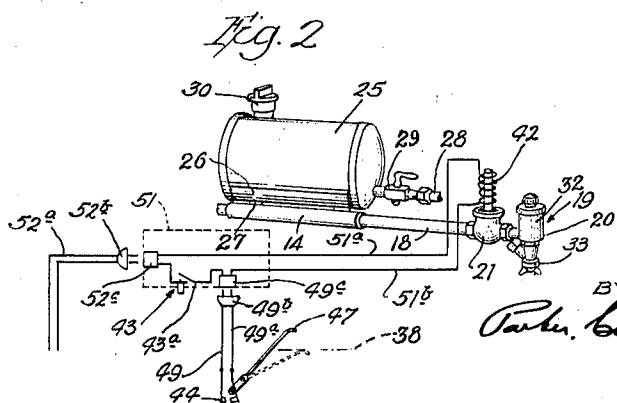


Fig. 2

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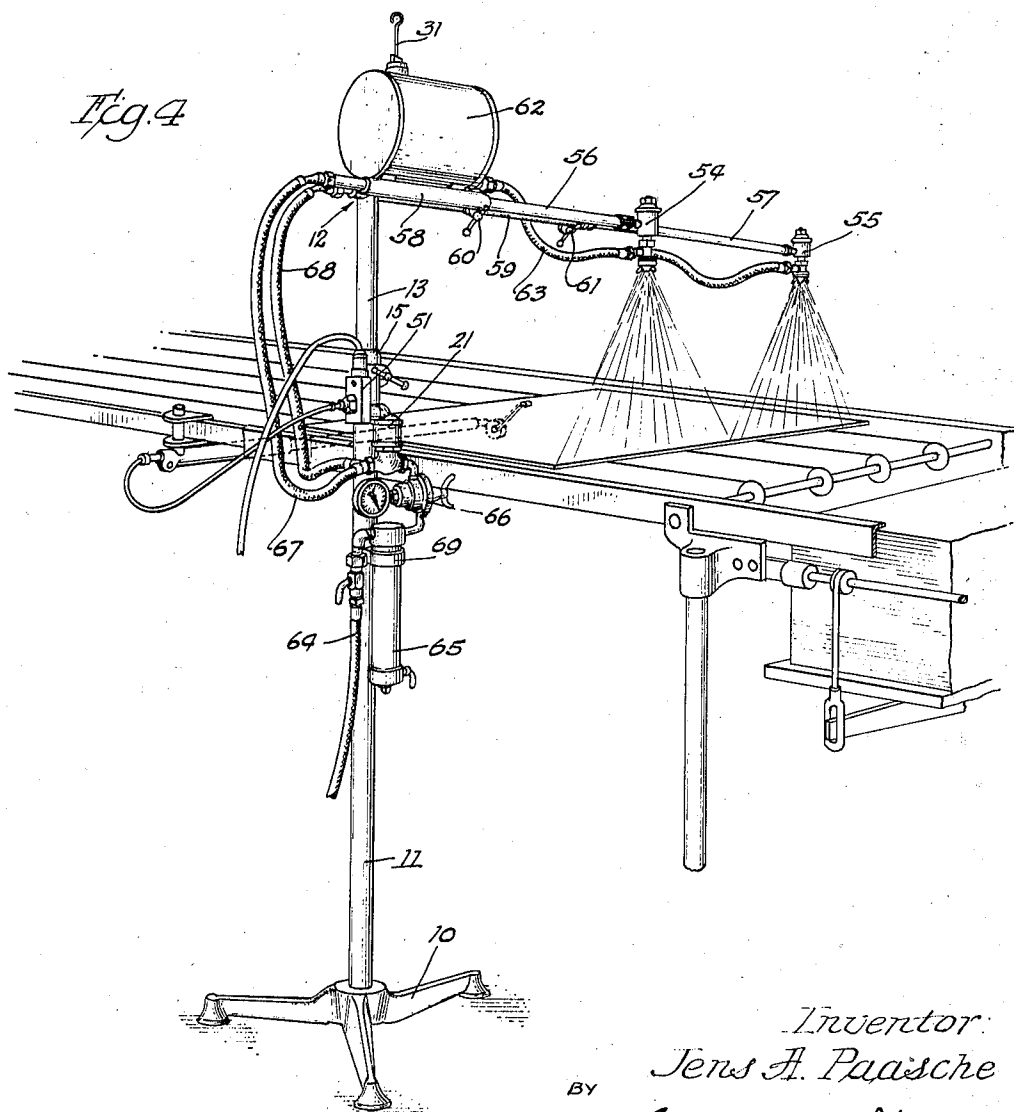
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SURFACE TREATING APPARATUS

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Application July 15, 1936, Serial No. 90,787

8 Claims. (Cl. 91—45)

This invention relates to surface treating apparatus and more particularly to improved apparatus for surface treating an object carried through a treating zone, such, for example, as treatment by the deposition of a layer of spaced particles of a separating substance upon the freshly inked surface of a printed sheet to prevent offset of the ink to a superimposed surface.

In its principal aspect the invention contemplates the provision of novel portable air treating equipment constructed as a complete unit which may be quickly and easily transported to any desired location for use in creating and directing a mist of treating material toward the surface of an object in movement thereby.

A general object of the invention is to provide apparatus of this character comprising few and simple parts that may be quickly assembled to provide a strong, compact and readily portable unit which is easy to operate and highly efficient in use.

Another object is to provide a portable pneumatically operable surface treating unit in which air under pressure and material fed by gravity are united at a point of emission and directed in the form of a controlled, variable mist toward a surface placed within the effective range of the misting appliance of the unit.

Stated more specifically, an object of the invention resides in the provision of a unitary assembly in which a mist-creating, pneumatically operable appliance is supported portably by a stand which also carries a supply of treating material that may be fed by gravity to the appliance whence it is projected in mist-like form by pressure fluid force toward the surface of an object placed within the effective range of the appliance.

Another object is to provide a surface treating unit in which the operating parts are arranged in balanced relationship upon a cross arm so that the centralization of weight of the unit will permit the use of a small, relatively light-weight stand.

Another object is to provide an improved air misting apparatus in which a pneumatic misting appliance and means for controlling the flow of pressure fluid to the appliance are carried by a common support in such relationship that they may overlie the path of a moving article to be treated for directing mist toward the latter upon the entrance thereof into the effective range of the appliance.

Another object resides in the improvements in construction and the novel relationships of parts

by which the foregoing and other objects and advantages of the invention may be carried into practice simply and economically.

Other objects and advantages will become apparent from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view showing a preferred form of the apparatus associated with a printing press.

Fig. 2 is a somewhat schematic view of the operation controlling electrical circuit of the apparatus.

Fig. 3 is an enlarged elevational view of the spraying appliance of the apparatus.

Fig. 4 is a perspective view of a modified form of the apparatus.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In a preferred form of the invention, a compact upright supporting means has an arm which extends substantially to one side thereof and carries a pneumatically operable air misting appliance to which treating material is delivered by gravity feed from a reservoir supported in a plane above the emission point of the misting appliance. The appliance is preferably of the pneumatically operated type, and the apparatus includes conditioning means for assuring a clean, dry supply of pressure fluid free from fluctuations in pressure for operating the appliance. The air-conditioning means is incorporated in the apparatus in structural cooperation with the appliance and the reservoir to produce a well balanced compact unit. Operation of the misting appliance is controllable in response to the movement of an object to be surface treated through the treating zone of the appliance and the apparatus embodies electrical controls for this purpose.

The invention is eminently suitable for use in the prevention of ink offset in printing operations. That is, the apparatus is equipped to practice the method of preventing ink offset which consists in applying to the inked surface of a printed sheet, a uniform, discontinuous layer of substantially microscopically small particles which are practically invisible to the naked eye,

but which will support a superimposed sheet surface out of contact with the freshly inked surface to prevent transference of ink from surface to surface.

- 5 As shown in the drawings, the apparatus embodies a base or stand 10 from which rises an upright tubular standard 11. A head structure, generally indicated at 12, is mounted on the upper end of the standard and comprises a post 13 having one end adapted to fit telescopically into the upper end of the standard 11, and a tubular socket 14 permanently fixed in cantilever fashion to the other end of the post 13 and extending therefrom in substantially right angular relation. 10 For proper balance, the axis of the post and socket are preferably approximately coplanar. The post 13 may be adjustably connected with the standard in any suitable manner as by means of a clamping collar 15 on the standard manipulable by a wing nut 17.

- To establish a balanced assembly, the center of mass is preferably disposed at or close to the axis of the standard 11. To this end, various operating parts of the unit may be mounted on a hollow tubular arm 18 which is intermediately and slidably supported by the socket 14. One end of the arm extends a substantial distance beyond the socket and carries a pneumatically operable treating appliance, indicated generally by the numeral 19, and comprising a device 20 commonly termed an air gun and operation controlling mechanism 21 therefor, which parts will hereinafter be more fully described. At its opposite end the arm supports air conditioning mechanism which preferably includes, in series connection with the hollow arm, an air regulator 22 for assuring uniform air pressure and an oil and water separator 23. Compressed air from any suitable source (not shown), as the pressure fluid, is delivered first to the separator through an inlet nipple 24. Through this arrangement, the arm 18 may serve as a conduit for delivering compressed air to the treating appliance 19. 20

- It will be evident that all of the parts supported by the arm 18 are disposed in a plane parallel with the axis of the socket 14 and that the weight of the parts is equally distributed about the standard 11 as a center, thereby rendering the apparatus firm and steady in operation and assuring that any adjustment of the parts will be maintained permanently while in use. 25

- Material for the air gun is preferably supplied thereto by gravity feed from a supply reservoir 25. The reservoir may conveniently be mounted above and supported by the socket 14 by such means as a saddle 26 for the reservoir and lugs 27 on the saddle for rigid connection with the socket 14. A conduit 28 extends from a valve controlled outlet 29 on the reservoir to the material inlet of the air gun. The reservoir is filled through a capped inlet 30 and a suitable fluid level indicator 31 may extend therethrough. Thus, the weight of the material supply is also substantially centered on the standard, yet the reservoir is readily accessible for refilling. 30

- The air gun 20 is preferably of a type which is adapted for rapid, intermittent operation such, for example, as that described in my copending application Serial No. 551,137, filed July 16, 1931, now Patent No. 2,059,706, issued November 3, 1936. This gun embodies a barrel 32 which houses the operating mechanism of the device, including a piston operator responsive to the admission of compressed air to open control valves for air and material. The barrel has a misting head 33 from 35

which the material is discharged in the form of a fine, misty-fan-shaped spray. The character of the spray is adjustable by manipulating control knobs 34 and 35 and a variation from a very fine mist to a coarse heavy mist may be obtained. 5

The present invention is especially well adapted for use in connection with the process of preventing ink offset in printing. In such a use, the material to be sprayed comprises generally a solid base material dissolved or suspended in a relatively volatile liquid carrying medium. The portable unit is so associated with a printing press 37 that the freshly printed matter, such as sheets 38 on conveyer 39, may be subjected to the spray from the air gun 20 as they pass from the press to a collection point, in this instance, a stacker 40. The air gun is adjusted to deliver a light, medium or heavy spray as required by a light, medium or heavy ink treatment of the printed matter and the distance between the gun and the printed matter is so fixed that the particles of sprayed material will reach the printed surface to be treated in a substantially dry condition. Where the press is operating on a continuous web, the air gun may be in constant operation, but, where separate sheets are printed the operation of the air gun, to avoid waste and undesirable coating of the machinery, must be synchronized with the movement of the sheets through the zone of spraying. 10 15 20 25 30

In a preferred form, the air gun operation-controlling means 21 includes a normally closed valve 41 interposed in the compressed air supply line. As shown in Fig. 3, the valve is mounted closely adjacent to the air gun, thus maintaining a supply of pressure fluid in the line up to a point next to the gun and leaving only a relatively short length of conduit between the valve and the atomizing parts of the air gun. As a result, the time lag between actuation of the valve and initial spray created is of minimum duration. The gun will respond almost instantly when the valve 41 is opened. This feature is covered broadly in my copending application Serial No. 156,153, filed July 28, 1937. 35 40 45

Associated with the valve is an electric operator, such as a solenoid 42, which is connected in series with a master switch 43 and an operation-governing switch 44 (Fig. 2). The operation governing switch 44 includes suitable contacts arranged to be relatively moved into circuit closing position by the movement of a pivotally mounted sheet contactor or actuator arm 47. The governing switch assembly is mounted on the end of a supporting arm 45 which is arranged to be removably attached by brackets 48, or the like, to the frame of the printing press in such position that the switch actuating arm 47 extends across the path of movement of the newly printed sheets. 50 55

With particular reference to Fig. 2, the electrical connections include leads 49 and 49^a housed in a cable 50 (Fig. 1) which extends from the governing switch assembly and terminates in a two-prong detachable connector 49^b, the complementary socket 49^c for which is mounted on a switch box 51. The switch box 51 may be conveniently mounted adjacent the juncture of the post 13 and the socket 14. The winding of the solenoid 42 has its opposite ends connected with leads 51^a and 51^b of a cable 52 (Fig. 1) which extends to and is preferably connected permanently with the switch box. One lead from the solenoid winding, herein lead 51^a, is arranged to be connected directly to one lead 52^a of a current supply main 53 (Fig. 1) through a socket 52^c and 70 75

prong 52^b connection. The other lead 51^b connects with one terminal of the socket 49^c, and a lead 43^a from the other socket terminal leads to the master switch 43 and then to the socket 52^c for connection to the supply main. Thus, the solenoid cannot be energized unless the governing switch 44 is plugged into the circuit.

A proper correlation of the positions of the governing switch 44 and the narrow elongated spraying zone may be easily determined so that the leading edge of a sheet will first strike the actuator arm 47 and then move just into the spraying zone as the first portion of the spray, produced as a result of closing the switch, reaches the path of the sheet. Cessation of operation is, of course, correspondingly obtained, when the trailing edge of the sheet passes out of contact with the arm 47, thereby allowing the latter to move to its original position to open the switch 44. All other mechanical adjustments may be as easily and efficiently made. Thus, the spacing of the air gun 20 from the surface of the sheet undergoing treatment, is adjusted by raising or lowering the supporting head 12. For best results, the misting head 33 of the gun should be disposed centrally of the sheet and at an angle to the surface thereof, and this adjustment is attained by axially or angularly moving the arm 18 within the socket 14.

In the modified form of the invention shown in Fig. 4, a plurality of air guns 54 and 55 is provided for treating the surface of a sheet which is wider than may be effectively treated by a single air gun, or for simultaneously treating parallel rows of sheets. Each of the air guns 54 and 55 is adjustably carried by a separate tubular arm 56 and 57, respectively. These arms are of different lengths to support the guns in such spaced relation that the spray streams therefrom will coact to provide a continuous spray pattern across the surface of the sheets undergoing treatment. Support for the arms 56 and 57 is provided by parallel tubular sockets 58 and 59, respectively, which are secured rigidly upon the upper end of the post 13. Any annular or axial position of adjustment of the arms may be maintained fixedly by tightening wing nuts 60 and 61 to clamp the arms against relative movement within the sockets.

A supply of material to be sprayed is contained in a gravity feed tank 62 mounted above the standard 11, and the tank may be supported equally by both of the sockets 58 and 59. Material from the tank is supplied to the air guns through a conduit 63. Pressure fluid, such as compressed air, passes through a conduit 64 from any suitable source into an oil and water separator 65, a pressure regulating valve mechanism 66, and then through flexible air conduits 67 and 68 to the respective arms 56 and 57. In the present instance the separator is supported upon the standard 11 by means of a bracket 69.

Operation of the modified form of the apparatus is controlled electrically in substantially the manner described in connection with the form shown in Fig. 1, but the controlling mechanism 21, including the air control valve 41 and the solenoid 42, are preferably mounted adjacent to the outlet side of the regulator 66. In this instance, the solenoid actuated valve controls the operation of both air guns simultaneously. For the purpose of unifying the construction, the master switch box 51 may be mounted as a unit with the actuator mechanism 21.

From the foregoing description, it will be ap-

parent that the present invention provides a novel portable surface treating apparatus which is simple in construction and highly efficient in operation. All parts of the apparatus are correlated to provide a uniform, balanced structure which is light in weight and which may be easily moved into position for use. Moreover, every adjustment necessary to adapt the portable mechanism to the type of printing press with which it is to be used may be quickly and accurately made for most efficient performance, thus permitting the device to be widely employed.

Cross reference is made to my copending applications Serial No. 744,155, filed September 15, 1934, and Serial No. 115,738, filed December 14, 1936, as covering subject matter of invention disclosed but not claimed herein.

I claim as my invention:

1. Surface treating apparatus for operative association with printing presses or like machines comprising, in combination, an upstanding light weight portable support, a horizontally extending member mounted at the upper end of said support for longitudinal and rotational adjustment, means mounted on said member for creating and directing a finely divided spray of material toward a surface to be treated, a material supply reservoir disposed above the spray means and connected to supply material thereto by gravity feed, means for supplying air under pressure to said spray means, and means for rendering said spray means operative or inoperative in timed relation to operation of the machine with which the apparatus is associated, including an actuator for starting and stopping the operation of said spray means, and control means operatively connected with said actuator and including means for adjustably installing said control means in said machine.

2. A surface treating apparatus adapted for operative association with printing presses or the like of various types comprising, in combination, an upright support capable of being readily transported by hand from place to place, a horizontally extending member of substantial length at the upper end of said support, a pneumatic spraying device mounted at one end of said member for proper disposition above a surface to be treated, actuating means for said device supported by said member, a material supply reservoir disposed above said device and communicating therewith to supply surface treating material to said device by gravity feed, means positioned adjacent to the vertical center of said support for conditioning air supplied to said device and having an operating connection with said device, and control means for said actuating means having a connection therewith and including means for adjustably incorporating said control means in the various types of machines with which the apparatus is used to obtain a required correlation between machine and apparatus operations.

3. A surface treating apparatus adapted for operative association with printing presses or the like of various types comprising, in combination, an upright support capable of being readily transported by hand from place to place, a horizontally extending member of substantial length at the upper end of said support, a pneumatic spraying device mounted at one end of said member for proper disposition above a surface to be treated, actuating means for said device, a material supply reservoir disposed above said device and communicating therewith to supply surface treating material to said device by gravity feed, means for

supplying air to said device, and control means for said actuating means comprising a separate assembly having means responsive to machine operation for controlling the starting and stopping of said actuating means, and a supporting member for the controlling means adapted to be removably and adjustably associated with various types of machines.

4. Portable surface treating apparatus of the character described comprising, in combination, a stand including an upright standard having upon its upper end a transverse tubular member, a supporting arm passing slidably through said tubular member with its opposite ends projecting beyond the ends of the member, surface treating means on one of said ends, pressure fluid conditioning means mounted upon the other of said ends, said treating and conditioning means having a substantially balanced weight relationship relative to said standard, and means for controlling operation of said treating means.

5. Portable surface treating apparatus of the character described comprising, in combination, a stand including an upright standard having upon its upper end a transverse tubular member, a supporting arm extending through said tubular member and at each end projecting therebeyond, pressure fluid operated surface treating means on one of said ends, pressure fluid conditioning means mounted upon the other of said ends, means for controlling operation of said treating means, and a tank carried by said tubular member, the combined center of mass of the apparatus falling substantially along the axis of said standard.

6. Surface treating apparatus of the character described comprising, in combination, supporting means having an overhanging tubular arm including a pneumatically operable device mounted to direct a spray of material toward the surface of an object to be treated, means for delivering

pressure fluid through said arm to said device for operating the same, and electrically actuated means carried by said arm closely adjacent to said device and operable when an object is within the effective range of said device for controlling the flow of pressure fluid thereto.

7. In combination in gravity feed spraying apparatus of the character described, a base, a standard rising from said base, an elongated tubular head supported by and extending across the axis of said standard, means for adjusting the position of said head vertically along the upright axis of said standard, an arm extending through and from said head cantilever fashion and having a spraying device mounted thereon, means for securing said arm to said head, means for delivering pressure fluid to said device, and a tank connected with said device and mounted above said head for delivering material to said device by gravity feed regardless of the vertical position of the adjustment of said head.

8. In apparatus for treating sheets to prevent ink offset in printing, the combination of a portable stand comprising a base adapted to rest upon a floor and a standard rising therefrom to a height sufficient to extend substantially above the sheet carrying means of a printing press installation with which the apparatus may be associated, a transverse arm having a spraying appliance mounted upon one end thereof, means for connecting the opposite end of said arm to the upper portion of said standard with said appliance arranged to direct a stream of finely divided offset preventing material toward the surface of a sheet to be treated, means for supplying operating pressure fluid to said appliance, a material receptacle carried by the stand and having an outlet in a plane above said appliance, and a gravity feed duct connecting said outlet directly with said appliance.

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