Nov. 5, 1968 S. M. CLAUSEN 3,408,934

BLANKET CLEANING ATTACHMENT FOR OFFSET PRESSES

Filed March 7, 1967 4 Sheets-Sheet 1

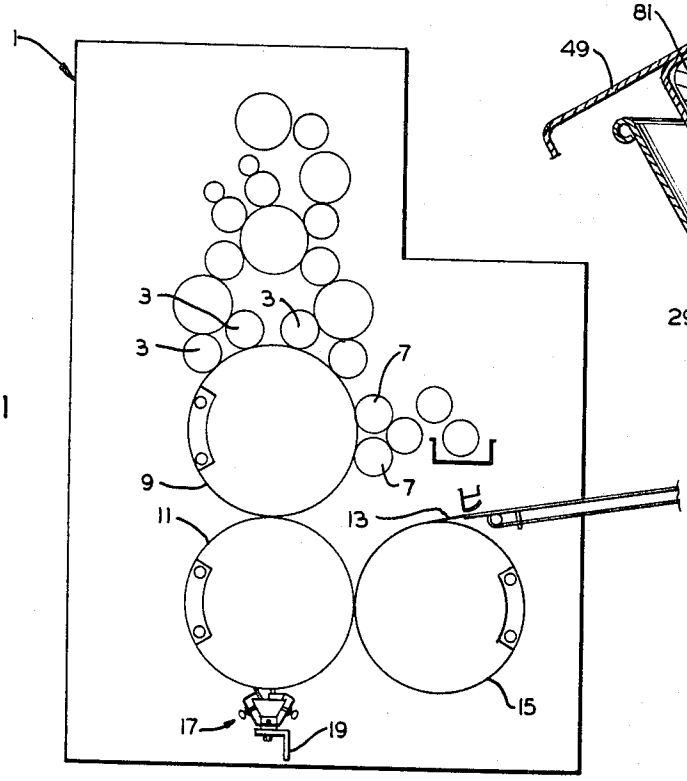


FIG. 1

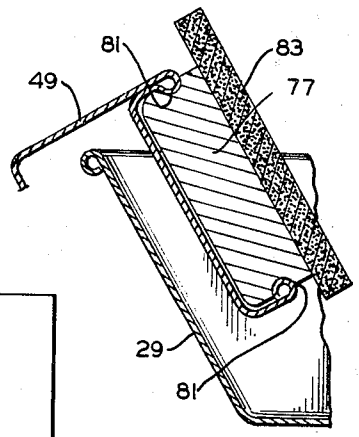


FIG. 5

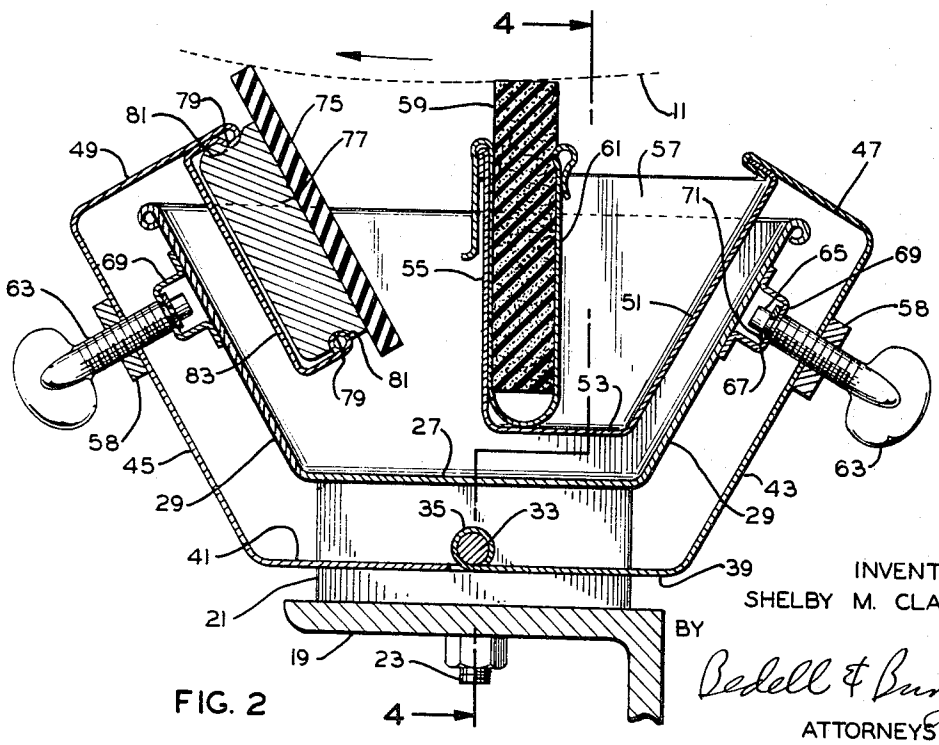


FIG. 2

INVENTOR
SHELBY M. CLAUSEN

BY

Bedell & Burgess

ATTORNEYS

Nov. 5, 1968 S. M. CLAUSEN 3,408,934

BLANKET CLEANING ATTACHMENT FOR OFFSET PRESSES

Filed March 7, 1967 4 Sheets-Sheet 2

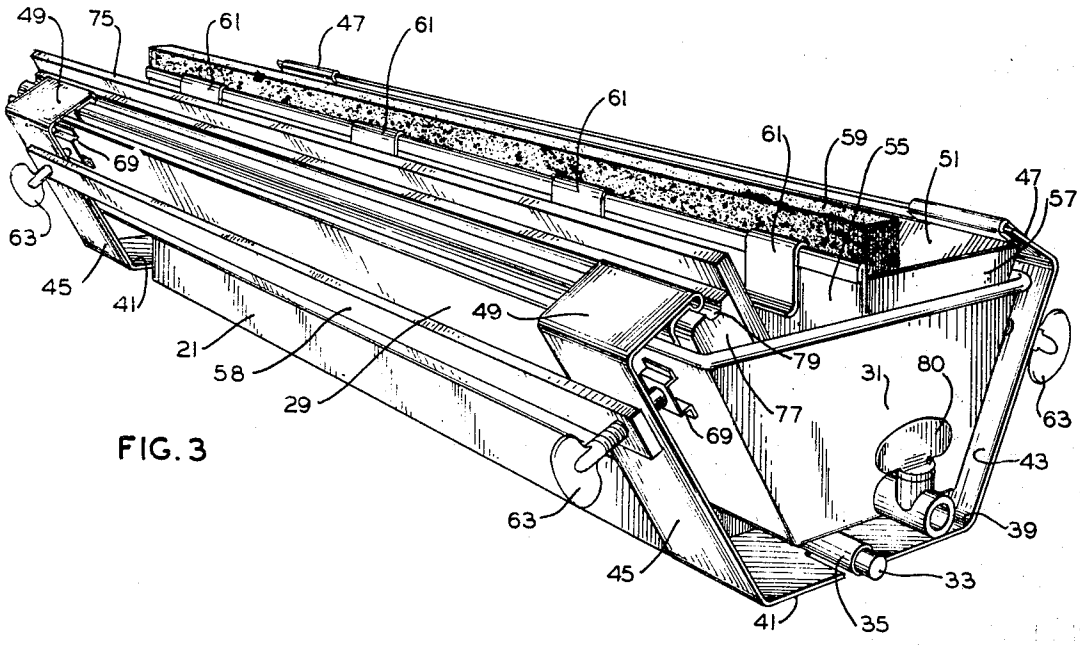


FIG. 3

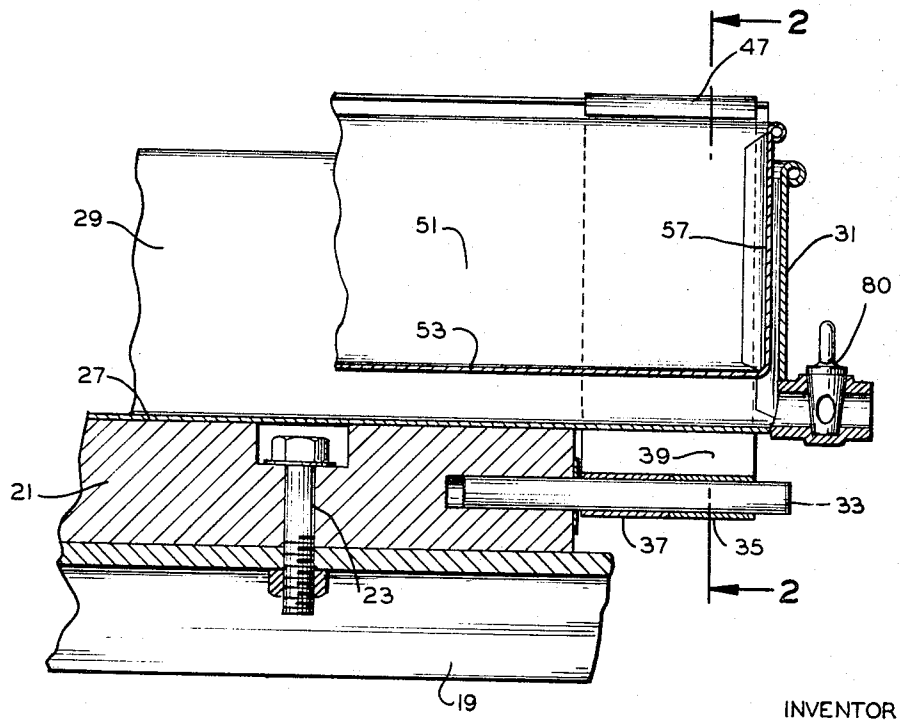


FIG. 4

INVENTOR
SHELBY M. CLAUSEN

BY

Bedell & Burgess

ATTORNEYS

Nov. 5, 1968 S. M. CLAUSEN 3,408,934

BLANKET CLEANING ATTACHMENT FOR OFFSET PRESSES

Filed March 7, 1967 4 Sheets-Sheet 3

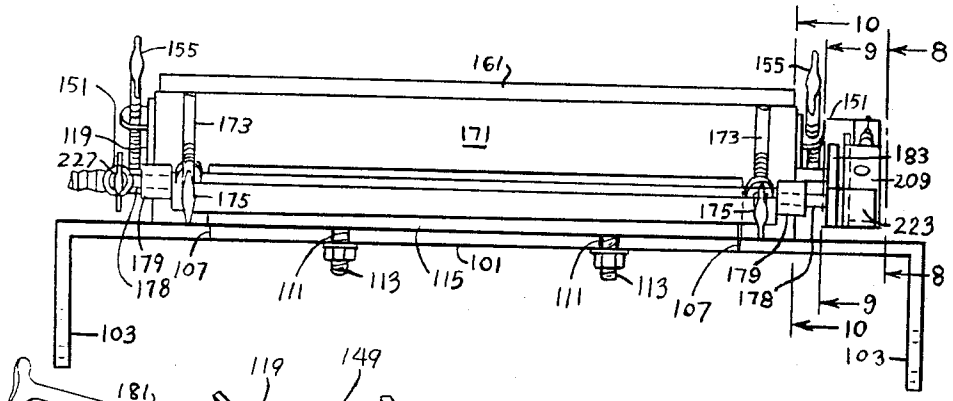


FIG. 6

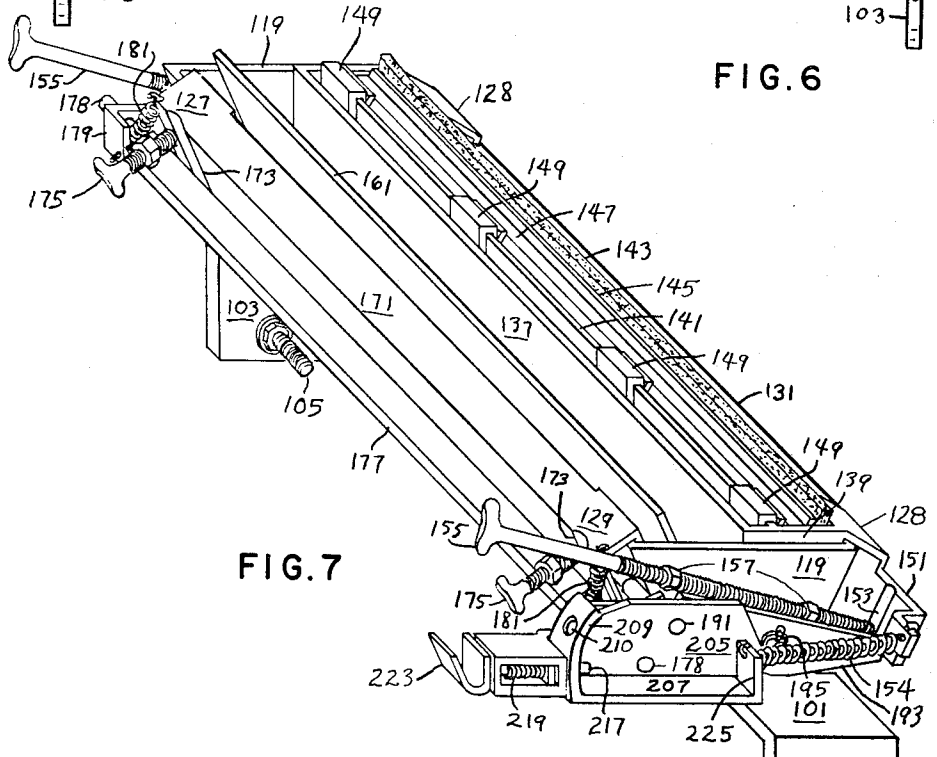


FIG. 7

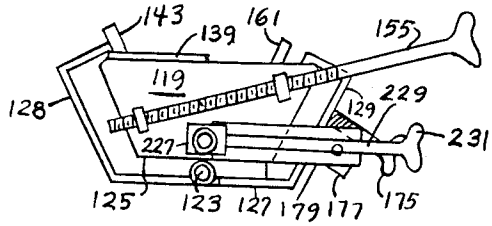


FIG. 15

INVENTOR:
SHELBY M. CLAUSEN

BY Bedell & Burgess

ATTORNEYS

Nov. 5, 1968 S. M. CLAUSEN 3,408,934

BLANKET CLEANING ATTACHMENT FOR OFFSET PRESSES

Filed March 7, 1967 4 Sheets-Sheet 4

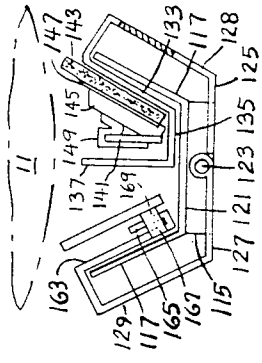


FIG. 10

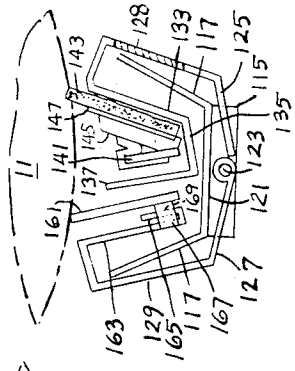


FIG. 13

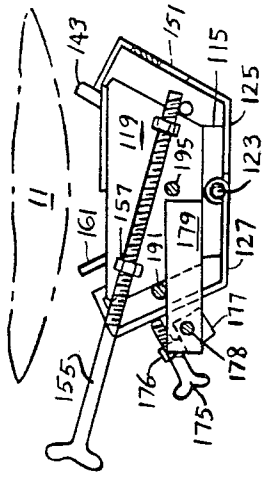


FIG. 9

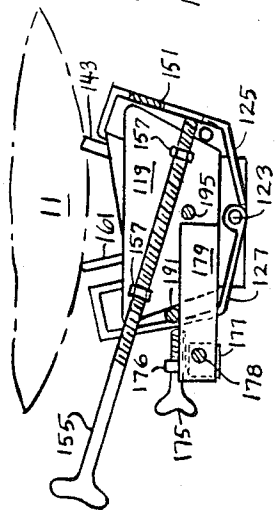


FIG. 12

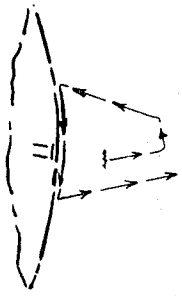


FIG. 14

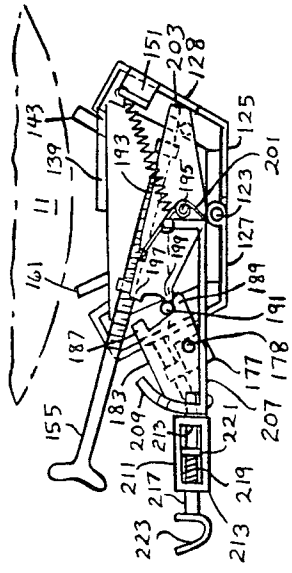


FIG. 8

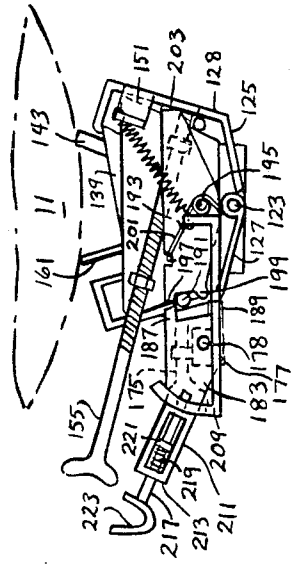


FIG. 11

INVENTOR:
SHELBY M. CLAUSEN

BY Bedell & Burgess
ATTORNEYS

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3,408,934

BLANKET CLEANING ATTACHMENT FOR OFFSET PRESSES

Shelby M. Clausen, 1407 E. Richwood Blvd., Peoria, Ill. 61603

Continuation-in-part of application Ser. No. 496,567, Oct. 15, 1965. This application Mar. 7, 1967, Ser. No. 634,398

21 Claims. (Cl. 101—425)

ABSTRACT OF THE DISCLOSURE

An attachment for cleaning cylindrical surfaces, such as the surface of an offset printing press blanket cylinder, comprising a tray arranged for stationary mounting adjacent the surface, a cleansing fluid pan in the tray, and containing a wick elongated parallel to the axis of the surface and having an edge engageable with the surface for distributing the cleansing fluid thereto, and a similarly elongated wiper blade mounted in the tray and having an edge engageable with the surface for wiping cleansing fluid and accumulated foreign matter from the surface and depositing the same in the tray.

This application is a continuation-in-part of my copending application Ser. No. 496,567 filed Oct. 15, 1965 now abandoned.

The invention relates to cleaning apparatus for offset printing presses and consists particularly in an attachment for cleaning the blanket cylinders of such presses.

Conventional offset presses have three cylinders—a plate cylinder, to which the plate carrying the image is secured, a blanket cylinder covered with a rubber sheet or blanket and in tangential engagement with the plate to receive from the plate the inked portions of the image, and an impression cylinder between which and the blanket cylinder the paper passes to receive an impression from the blanket cylinder.

During operation of an offset press the blanket cylinder accumulates foreign matter including coating and lint from the paper which forms piling on the cylinder. Static electricity is also produced on the blanket cylinder. This results in poor transference of the inked image from the plate cylinder to the blanket cylinder, and from the blanket cylinder to the paper. Excess water on the blanket cylinder from the dampening rollers which dampen the plate cylinder is also troublesome.

Accordingly it is the object of the invention to provide simple yet effective means for preventing the accumulation of foreign matter, excess water and static electricity on the surfaces of offset press blanket cylinders.

The foregoing and additional more detailed objects and advantages of the invention are achieved by the device described hereinafter and illustrated in the accompanying drawings in which:

FIG. 1 is a diagrammatic view of an offset press to which my invention is applied.

FIG. 2 is a transverse sectional view of my blanket cylinder cleaning attachment along line 2—2 of FIG. 4.

FIG. 3 is a perspective view of my blanket cylinder cleaning attachment.

FIG. 4 is a fragmentary longitudinal vertical sectional view of my blanket cylinder cleaning attachment along line 4—4 of FIG. 2.

FIG. 5 is a fragmentary transverse vertical sectional view of my attachment showing a modified wiper blade construction.

FIG. 6 is a side elevation view of another form of blanket cylinder cleaning attachment.

FIG. 7 is a perspective view of the cleaning attachment illustrated in FIG. 6.

FIGS. 8, 9 and 10 are transverse vertical sectional views along lines 8—8, 9—9 and 10—10 respectively of FIG. 6. In FIG. 8 the adjustment bracket web is eliminated to improve clarity.

FIGS. 11, 12 and 13 are transverse vertical sectional views corresponding to FIGS. 8, 9 and 10 but showing the parts in the roll-engaging position.

FIG. 14 illustrates schematically the flow of fluid in the system.

FIG. 15 is an elevation view of the end of the tray remote from that shown in FIGS. 7, 8, 9, 11 and 12.

The numeral 1 indicates an offset press having ink form rollers 5 and damping form rollers 7 engaging plate cylinder 9, which in turn is in tangential engagement with blanket cylinder 11. Paper 13 is urged into impression-transferring engagement with blanket cylinder 11 by impression cylinder 15.

My cleaning attachment, generally indicated at 17, is mounted on bracket 19 on the press beneath the blanket cylinder 11, posterior along the direction of rotation of the blanket cylinder from the line of engagement between the blanket cylinder and the impression cylinder and anterior to the line of engagement between the blanket cylinder and the plate cylinder, and has a base 21 connected to bracket 19 by bolts 23. Base 21 is secured to the flat bottom of an elongated tray having outwardly sloping sides 29 and upright ends 31.

Pins 33 projecting longitudinally from the opposite ends of base 21 form pivot bearings for the curved end portions 35 and 37 of C-shaped arms 39 and 41 which extend transversely outwardly below the bottom of tray 31 in opposite directions from pins 33 and then upwardly and outwardly as at 43 and 45 after which they are bent transversely inwardly as at 47 and 49 to terminate above the interior of tray 31. At its upper terminal 47, arms 39 support outer sloping side wall 51 of a pan having a flat bottom wall 53, an opposite upright side wall 55 and end walls 57, the slope of pan side wall 51 being similar to that of the adjacent tray side wall 29. Intermediate their ends, arm portions 43 and 45 at each side are connected by an elongated bar 58 to keep the arms in alignment with each other.

A flat elongated wick or strip 59 of capillary material is mounted by means of U-shaped clips 61 against the upright wall 55 of the pan, with its upper margin projecting upward from the pan and its lower portion extending well into the pan.

For adjusting the pressure of strip 59 against blanket cylinder 11, thumb screws 63 threadably extend through alignment bar 58 with their inner ends 65, of reduced diameter, extending through small holes 67 in channel brackets 69 on the outer surfaces of tray side walls 29, the shoulder thus formed on screws 63 being held against the outer surfaces of brackets 69 by U-washers 71 seated in suitable annular grooves in the reduced ends 65 of screws 63. By turning screws 63, arms 39, and with them, pan 51, 53, 55 and wick 59, can be adjusted to any desired position with respect to the surface of cylinder 11. The pan is filled with water or solvent, as desired, and thumb screws 63 are adjusted so that the upper edge of wick 59 will engage the surface of blanket cylinder 11 uniformly throughout the width of the former.

For removing foreign matter softened or dissolved by the water or solvent, and excess liquid from the surface of the blanket cylinder, arms 41, 45, 49 support a flat wiper blade 75, preferably of rubber or rubber-like material, which may be mounted on a block 77, grooved along its upper and lower surfaces as at 79 for clamping attachment between opposed projections 81 on the channel-shaped extensions 82 of arms 49.

By means of thumb screws 63, the upper edge of wiper blade 75 can be brought into light or heavy wiping en-

gagement, as desired, with the surface of blanket cylinder **11** so that all dissolved impurities and excess fluid on the surface of the blanket cylinder between the leading and trailing printing edges thereof will be removed thereby and will be discharged into tray **27, 29, 31**. For draining tray **27, 29, 31** after use, one of its ends **31** may be provided with a petcock **80**. Arms **39** and **41** are preferably of sheet metal construction of sufficient resilience to deflect slightly in the event any thickened accumulation on the blanket cylinder strikes the wick or the wiper blade, thus preventing damage to the structure.

Periodically, a blade **83** of abrasive material, such as pumice, may be substituted for the rubber blade **75**, for the purpose of removing glaze from the blanket cylinder.

Operation of the device is as follows: With the tray drained, adjustments of wick **59** and wiper **75** to bring them into uniform engagement with the blanket cylinder can be made by thumb screws **63**. Pan **51–57** is then filled with water, and after the press is started, further adjustments can be made in the position of wick **59** and wiper **75** relative to the blanket cylinder surface to assure the necessary cleansing and wiping action. As the blanket cylinder rotates clockwise as viewed in all the figures, water or solvent from pan **51–57** is applied to its surface by capillary action of wick **59** to dampen the surface of the blanket cylinder and soften the accumulation thereon. The water, excess gum, excess acid and other impurities on the cylinder are then wiped from the surface of the blanket cylinder when the latter passes wiper **75** and are discharged from wiper **75** into tray **27, 29, 31**, so that when the surface of the blanket cylinder again engages the plate cylinder, all impurities and excess fluid have been removed and the inked image will transfer properly from the plate cylinder to the blanket cylinder.

Periodically, when the blanket becomes glazed, pumice blade **83** may be substituted for blade **75** and brought into engagement with the blanket cylinder surface by adjustment of screws **63**. As the blanket cylinder is rotated, it is moistened by water or solvent from wick **59**, the glaze being removed by the abrasive action of the pumice.

In the modified form of the invention shown in FIGS. 6–14 the press mount comprises a flat bar **101** with its ends **103** turned downwardly for attachment to the press beneath the blanket cylinder by bolts **105** and its intermediate portion slightly offset transversely of its length as at **107** and **109** to avoid interference with portions of the press structure. Bar **101** is transversely slotted at **111, 111**, in alignment with the attaching studs **113** which, like bolts **23** in the previous embodiment, depend from base **115** of the modified attachment, and studs **113** pass through these slots and are secured to bar **101** by nuts, the slots permitting some adjustment of the position of the attachment transversely of the press mount bar.

An elongaed tray, similar to tray **29, 31**, and having sloping sides **117** and upright ends **119**, is secured by means of its flat bottom **121** to base **115** with its ends projecting lengthwise a slight distance from base **115**. Pins **123** projecting longitudinally from the opposite ends of base **115** form pivot bearings for the lower ends of generaly C-shaped arms **125** and **127** which extend transversely outwardly in opposite directions from pins **123** below the bottom of tray **117, 119, 121** and then upwardly and outwardly at **128** and **129** respectively to a higher level than the sides of the tray after which they are bent inwardly to extend over the interior of the tray. The upwardly extending portions **128** of arms **125** are connected by a flat bar **131** which is preferably integral with both arms **125**, to assure their movement in unison. An elongated pan having a sloping side wall **133**, a bottom wall **135**, upright side wall **137** and upright end walls **139** is supported within the tray by the upper ends of arms **125** which are secured to the upper margin of pan sloping side wall **133**. An upright divider **141** is mounted within the pan and extends the full length thereof, but is spaced a slight distance from bottom wall **135**, and a wick **143** of capillary material is positioned against the sloping side wall **133**, with its bottom edge engaging the bottom of the pan and its upper margin projecting upwardly from the upper edge of sloping side wall **133** for engagement with the blanket cylinder. With this arrangement a positive angle of engagement of the wick with blanket cylinder **11** is provided, as distinguished from the substantially right angle engagement of the previous embodiment. For supporting the wick and rigidifying it, an elongated block **145**, with a thin plate **147** secured to it, is interposed between divider **141** and wick **143**, and the latter is secured, as by stapling, to these members. For holding block **145** in position, generally S-shaped clips are mounted on divider **141** with their opposite end engaging wick mounting block **145**.

For adjusting the inclination of the wick and its pressure against blanket cylinder **11**, arms **125** are formed with outwardly extending ears **151**, which are grooved at **153** along their surfaces facing the tray, and elongated thumb screws **155** are threadably mounted in brackets **157** on the end walls **119** of the tray, with their threaded ends seated in grooves **153** and their handle portions extending transversely outwardly from the tray to facilitate manual adjustment of the wick from the left side of the tray. Arms **125** and with them wick **143** are resiliently biased in a counterclockwise direction, i.e., toward screws **155**, by a coil spring **154** connected to ear **151** at the forward end of the tray as viewed in the drawings.

A flat wiper blade **161** of rubber or rubber-like material is supported from portions **129** of arms **127**. Arms **127** are each formed with extensions **163** depending within the tray from the upper extremities of portions **129**. Extensions **163** are formed with upturned end portions **165**, and blade **161** is secured along its lower margin to an elongated bar **167** slotted at **169** to receive arm extension end portions **165**. To provide for pivotal movement of both arms in unison, they are rigidly connected by an angle bar **171**. The outer surfaces of arms **127** are vertically grooved as at **173** to abuttingly receive the ends of short thumb screws **175**, which are threadably mounted at **176** on an elongated bar **177** extending parallel to the adjacent tray side wall. Bar **177** is formed with cylindrical ends **178** projecting from its upper corners nearest the tray and ends **178** are rotatably journaled in brackets **179** affixed to tray end walls **119**. Thumb screw mountings **176** are located on the bar at a higher level than and more remote from the tray than cylindrical ends **178** whereby to maximize movements of thumb screws **175** toward and away from arms **127** responsive to pivotal movements of the bar about ends **178**. Springs **181**, connected at their opposite ends to arms **127** and brackets **179** respectively, act in tension to bias the arms into engagement with screws **175**. From the foregoing it will be apparent that both the wiper blade and the wick can be adjusted from the same side of the tray by use of thumb screws **175** and **155** respectively.

To permit selective engagement and disengagement of the wick and wiper blade with the surface of the blanket cylinder without disturbing the thumb screw adjustment, a first plate-like control lever **183** is fixed intermediate its ends to one cylindrical end **178** of square bar **177** whereby rotation of lever **183** causes a corresponding rotation of bar **177** to move thumb screws **175** toward and away from the tray and thus either force wiper blade **161** into engagement with the blanket cylinder or permit springs **181** to retract it.

At its inner end lever **183** is formed with vertically spaced bifurcations **187** and **189**, the opposing faces of which are alternately engageable with stop pin **191** projecting from tray end wall **119** adjacent the tray side nearest the wiper blade.

A second plate-like lever **193**, coplanar with lever **183**, is fulcrumed on pin **195** projecting from the middle of tray end wall **119**. The end of lever **193** adjacent the bifurcated end of lever **183** is provided with a pair of ver-

tically spaced bifurcations **197** and **199**, somewhat more closely spaced than bifurcations **187** and **189** of lever **183**, with bifurcation **199** projecting above bifurcation **189** so as to be underlyingly engaged by the latter upon counterclockwise movement of lever **183** and thus produce clockwise movement of lever **193**, lever **193** being biased counterclockwise by torsion spring **201** on pin **195** so as to maintain bifurcation **197** against stop pin **191**. The outer end **203** of lever **193** engages ear **151** of blanket roll arm **125** so that when lever **193** is tilted clockwise, by counterclockwise tilting of lever **183**, ear **151**, wick arms **125**, the wick pan and wick **143** will be moved clockwise, with the wick moved away from engagement with the blanket cylinder.

For fixing the levers in the "on" and "off" positions, an adjustment bracket comprising an upright web **205** and flange **207** is rigidly supported from tray end **119** outwardly of levers **183** and **193** by stop pin **191** and pin **178**. The outer end portion **209** of flange **207** extends arcuately upward and is pierced with two arcuately spaced radial holes **210** corresponding to the limit positions of lever **183**. The outer end portion **211** of lever **183** protrudes outwardly beyond arcuate flange portion **209** and is of box-like shape, the radially spaced ends **213** of which are pierced to slidably accommodate radial plunger **217**, which is biased radially inwardly by a spring **219** seated on outer end **213** and acting against a shoulder **221** on the plunger. For retracting plunger **217**, it is formed with a V-shaped handle **223**. With this arrangement, the levers may be locked in the "on" position, with the wiper blade and wick in engagement with cylinder **11**, by insertion of plunger **217** in the upper hole, and conversely in the "off" position, by insertion of the plunger in the lower hole, removal of the plunger from the holes for rotation of the levers being accomplished by pulling on plunger handle **223**.

Adjustment bracket flange **207** is also formed with an upstanding rear end **225** to which is secured the forward end of wick spring **154**.

In order to facilitate draining of the tray, the end wall **119** remote from the "on-off" adjustment mechanism, best seen in FIG. 15, is provided with a petcock **227** having an elongated stem **229** extending forwardly therefrom and terminating in a handle portion. With this arrangement, after the attachment has been used, the used water and impurities dissolved therein may be drained from the tray from the same position forward of the tray as the wick adjustments are made.

Operation of the modified attachment is as follows: With the "on-off" control in the position shown in FIGS. 7 and 8, with plunger **217** in lower hole **210** of control bracket arcuate flange **209**, bottom bifurcation **189** on wiper control lever **183** underlyingly engages bottom projection **199** on wick control lever **193**, causing end **203** of the latter to engage ear **151** of wick arm **125** and hold the latter against the tension of spring **154** in the extreme clockwise position with wick pan sloping wall **133** nearly engaging the adjacent tray side wall **117**, as best seen in FIG. 10, and the wick out of engagement with cylinder **11**. Because of the rigid connection of end portions **178** of square bar **177** to control lever **183**, bar **177** is tilted counterclockwise, causing a corresponding movement of screws **175** away from the tray, so that springs **181** hold arms **127** at the extreme counterclockwise position, with their inner extensions **163** substantially against the adjacent tray side wall **117** and scraper blade **161** out of engagement with the blanket cylinder surface.

When it is desired to utilize the cleaning attachment, handle **223** is pulled outwardly to retract plunger **217** from lower hole **210**, and lever **183** is rotated clockwise to the position shown in FIG. 11, wherein plunger **217** is forced into the upper hole **210** by spring **219**. This movement of lever **183** causes a similar rotation of bar **177**, which causes screws **175** to push wiper blade arms **127** clockwise toward the surface of blanket cylinder **11**, after which precise adjustment of wiper blade **143** can be effected by manually turning adjustment screws **175**. The clockwise rotational movement of lever **183** also disengages its lower bifurcation **189** from lower projection **199** of lever **193**, permitting torsion spring **201** to force lever **193** counterclockwise until its upper projection **197** engages stop pin **191**. This movement of lever **193** permits spring **154** to move wick arms **125** counterclockwise and move wick **143** toward blanket cylinder **11**, after which precise adjustment of wick **143** can be effected by manually turning wick adjusement screws **155**.

The flow of fluid is diagrammatically shown in FIG. 14 in which arrows, originating at water level in the wick pan, between pan side wall **137** and divider **141** pass below the divider, thence up the wick by capillary action, thence along the surface of cylinder **11**, and thereafter down the wiper blade into the bottom of the tray, from which they may later be drained through petcock **227**.

Thereafter, when it is desired to disengage the cleaning attachment wick and wiper blade from the blanket cylinder, this can be effected without disturbing the adjustment of the wick and wiper blade adjustment screws **155** and **175** respectively by moving control lever from the position shown in FIG. 11 to that shown in FIG. 8.

The details of the cleaning apparatus may be modified substantially without departing from the spirit of the invention and the exclusive use of such modifications as come within the scope of the appended claims is contemplated.

What is claimed is:

1. A cleaning attachment for a cylindrical surface comprising a tray adapted for stationary mounting adjacent the cylindrical surface and elongated parallel to the axis of the cylindrical surface, a pan carried in said tray and mounting a wick elongated axially of the cylindrical surface and having an edge engageable therewith, and a similarly elongated wiper blade mounted in said tray and having an edge engageable with the cylindrical surface, said blade being positioned posterior to said wick along the direction of rotation of the cylindrical surface.

2. An attachment according to claim **1** including arms pivoted on an axis parallel to the axis of the cylindrical surface relative to said tray and forming the mounting of said pan on said tray.

3. An attachment according to claim **2** including means for fixing said arms at various positions about their axes whereby to adjust the positions of said wick relative to the cylindrical surface.

4. An attachment according to claim **3** in which said means comprises screws having an end rotatably secured to a portion of said tray and their other end threadably passing through said arms.

5. An attachment according to claim **1** including arms pivoted to said tray on an axis parallel to the axis of the cylindrical surface and forming the mounting of said wiper blade on said tray.

6. An attachment according to claim **2** including additional arms pivoted to said tray on an axis parallel to the axis of the cylindrical surface and forming the mounting of said wiper blades on said tray.

7. An attachment according to claim **6** in which the axes of said first-named and additional arms are aligned with each other.

8. An attachment according to claim **1** in which said wiper blade is of rubber-like material.

9. An attachment according to claim **1** in which said wiper blade is of abrasive material.

10. An attachment according to claim **2** including additional arms pivoted relative to said tray on an axis parallel to the axis of the cylindrical surface and forming the mounting of said wiper blade in said tray.

11. An attachment according to claim **10** including means for fixing said arms at various positions around

their axes whereby to adjust the positions of said wick and wiper blade relative to the cylindrical surface.

12. An attachment according to claim 11 including additional means for retracting said wick and wiper blade from engagement with the cylindrical surface without disturbing the adjustment effected by said first-named means.

13. An attachment according to claim 12 wherein said first-named means and said additional means are operable from the same side of said tray.

14. An attachment according to claim 12 in which said fixing means comprises separate screws extending transversely of and supported from said tray and resilient means biasing said arms against said screws.

15. An attachment according to claim 14 wherein said wick mounting arms and said wiper blade mounting arms are disposed on opposite sides of said tray from each other.

16. An attachment according to claim 15 wherein said screws engage corresponding surfaces of said wick mounting arms and said wiper blade mounting arms and are operable from the same side of said tray.

17. An attachment according to claim 16 including a member elongated lengthwise of said tray and supported therefrom along one side thereof for limited rotation about its longitudinal axis, said elongated member forming the support of said wiper blade screws and a first transverse lever fixed to said elongated member and selectively pivotable to rotate said elongated member and thus move said wiper blade screws between a first position maintaining said wiper blade in proximate relation with the cylindrical surface and a second position permitting said resilient means to retract said wiper blade from engagement with the cylindrical surface.

18. An attachment according to claim 17 wherein the support of said screws on said elongated member is offset outwardly with respect to said tray and upwardly from the rotation axis of said elongated member.

19. An attachment according to claim 16 including a second transverse lever fulcrumed on said tray and having a first end portion abuttingly engageable with said wick supporting arm when said lever is tilted about its fulcrum for opposing the action of said resilient means and causing retraction of said wick from engagement with the cylindrical surface.

20. An attachment according to claim 19 wherein said second lever is aligned with said first lever, said first end portion of said second lever being remote from said first lever, said first and second levers having adjacent end portions formed with cooperating projections engageable with each other upon rotation of said first lever from the first to second positions, to cause said second lever to tilt into engagement with said wick supporting arm, and resilient means biasing said second lever away from its tilted position.

21. An attachment according to claim 20 wherein said adjacent end portions of said levers are formed with vertically spaced bifurcations, there being a projection from said tray disposed between said bifurcations and engageable alternately with the upper or lower bifurcations to limit the rotation of both said levers, the lower bifurcation forming cooperating projections.

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ROBERT E. PULFREY, *Primary Examiner.*

F. A. WINANS, *Assistant Examiner.*