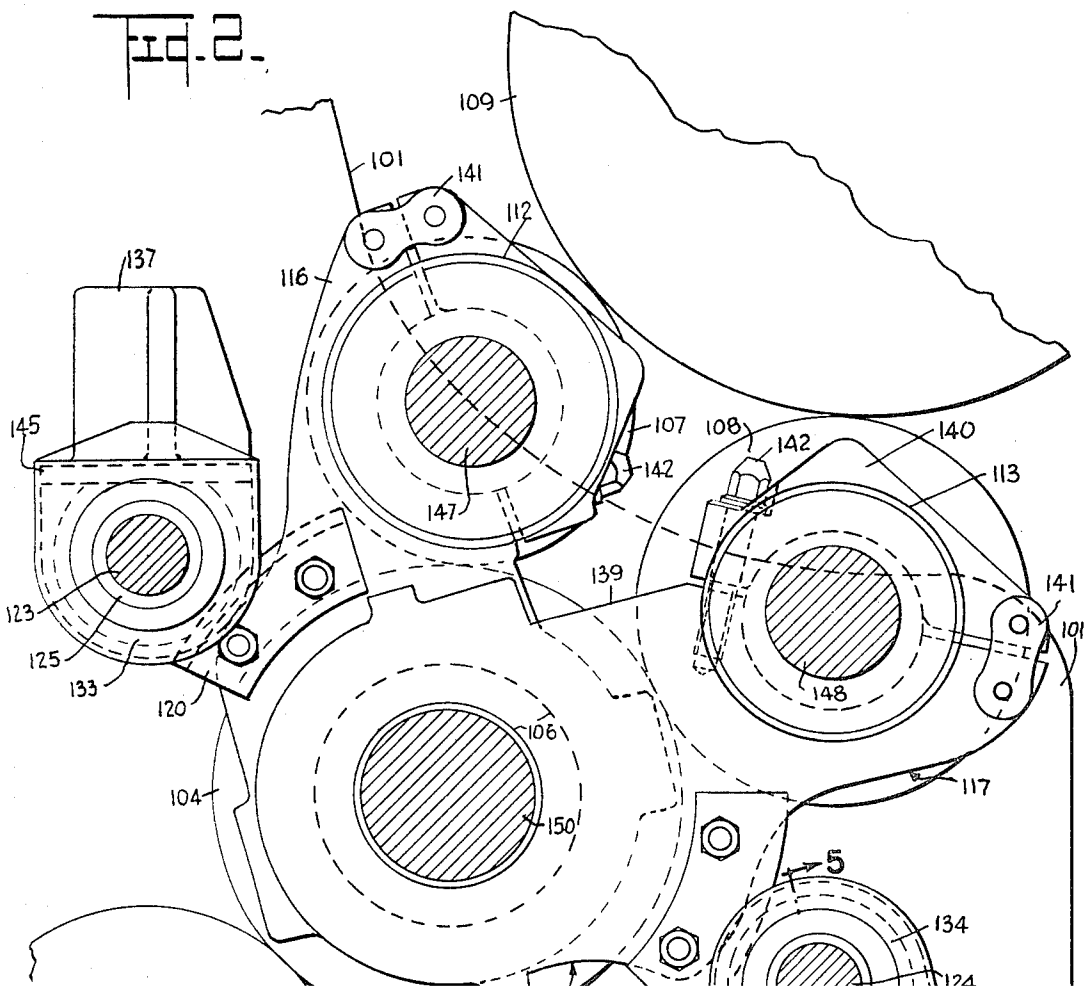
April 29, 1969 A. Z. BENDA ET AL 3,440,958

PRECISION ROLLER SOCKET ADJUSTMENT DEVICE

Filed June 29, 1967 Sheet 1 of 4

Fig. 2.



April 29, 1969 A. Z. BENDA ET AL 3,440,958

PRECISION ROLLER SOCKET ADJUSTMENT DEVICE

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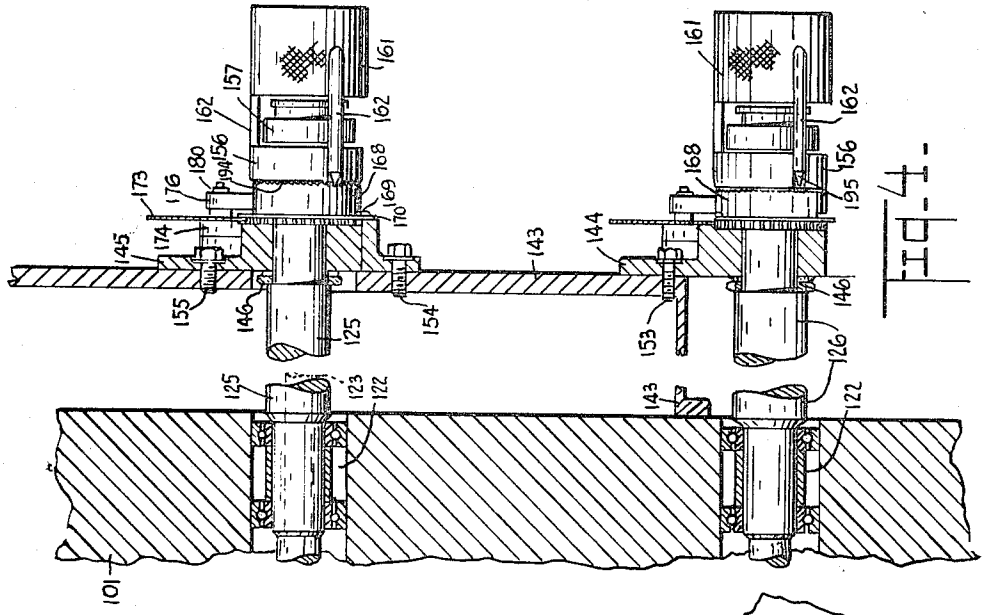


FIG. 4

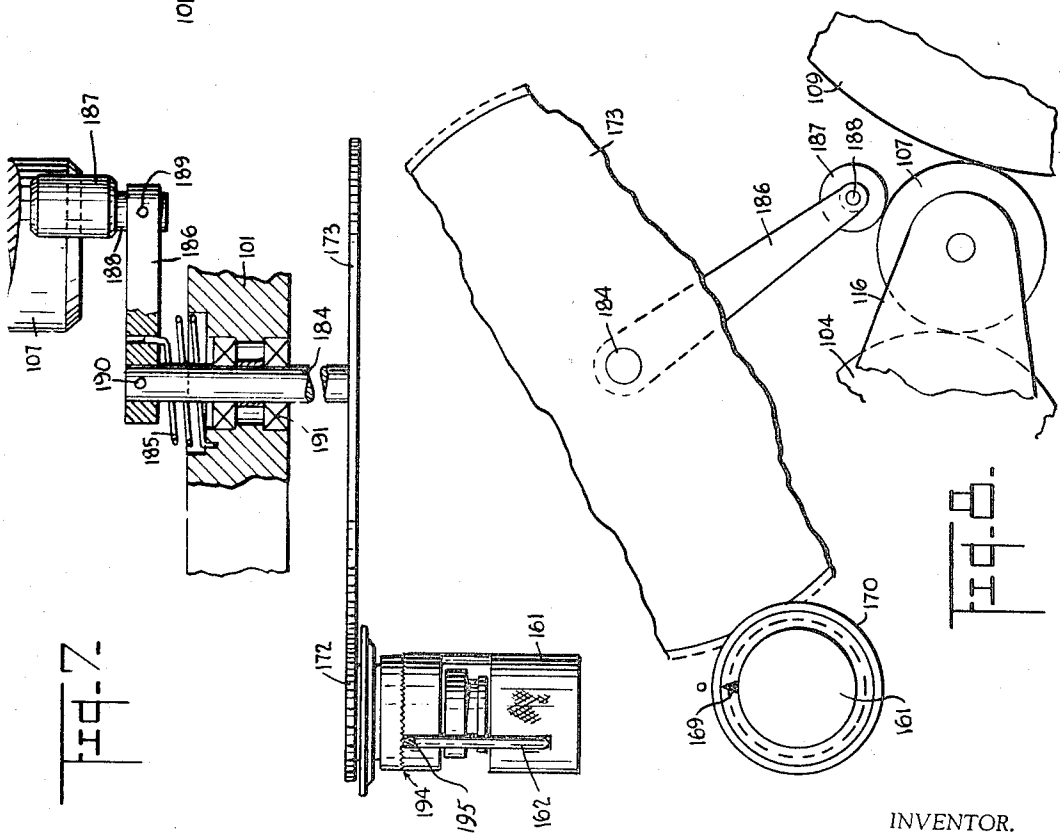


FIG. 7

FIG. 5

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PRECISION ROLLER SOCKET ADJUSTMENT DEVICE

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Fig. 6.

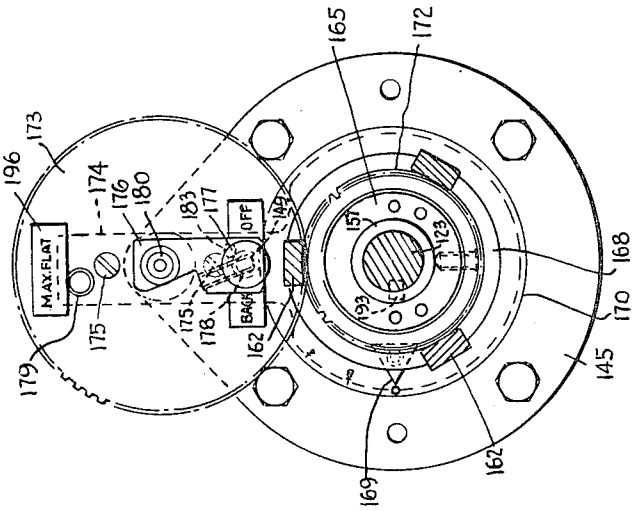
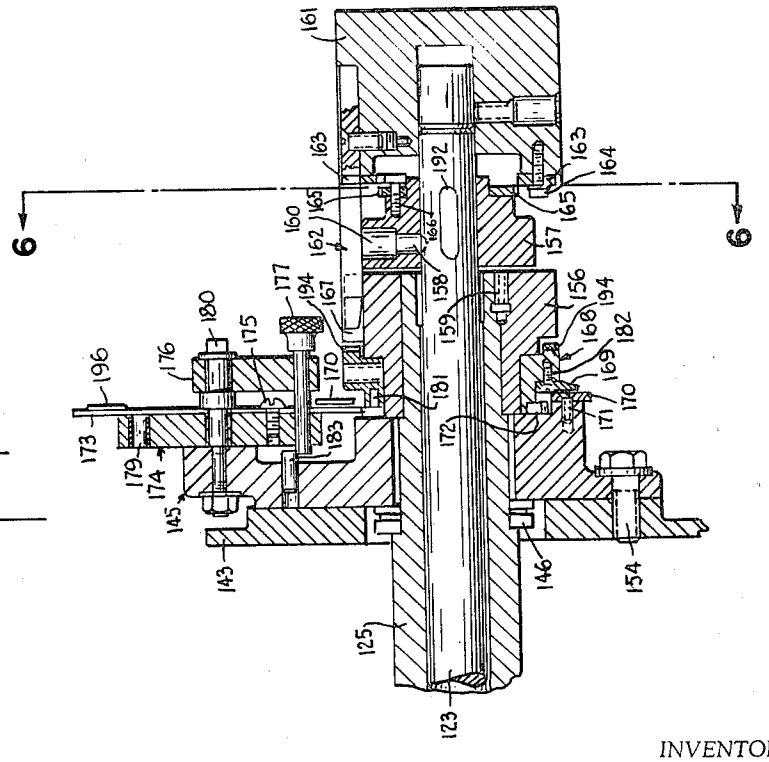


Fig. 5.



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United States Patent Office 3,440,958 Patented Apr. 29, 1969

3,440,958

PRECISION ROLLER SOCKET ADJUSTMENT DEVICE

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Filed June 29, 1967, Ser. No. 650,036
Int. Cl. B41f 31/00
U.S. Cl. 101—349 8 Claims

ABSTRACT OF THE DISCLOSURE

A device for adjusting the position of the roller socket of an ink motion having a solid shaft carried within a hollow shaft, each carrying a screw pinion having helical gears. The screw pinions engage helical gear segments which are fixed to a lever pivotally mounted about a bushing of the adjacent ink drums, each lever carries a roller socket. A knob mounted on an end of the solid-hollow shaft combination for rotating them individually or simultaneously whereby the screw pinions are caused to be axially displaced so as to cause rotation of the levers thereby adjusting the position of the roller sockets.

Background of the invention

This invention relates generally to printing presses and more particularly to a socket adjustment for the form rollers of a printing machine ink motion.

The conventional ink motion of rotary printing presses comprises a fountain roller, transfer rollers which transfer ink from the fountain roller through a series of ink drums and ink rollers to a printing plate cylinder. The ink rollers which transfer ink from the last ink drum to the plate cylinder are comprised of a number of soft-surfaced form rollers. The amount of ink to be transferred to the plate cylinder depends on the pressure which the form rollers exert on the plate cylinder and the ink drum.

It is commonly known that the form rollers tend to swell with continued use and with changes in ambient conditions, thereby resulting in a change of pressure which the form rollers exert on the plate cylinder and ink drum. It is therefore necessary that the form rollers be mounted in adjustable sockets so that the proper pressure can be maintained.

In order to determine the pressure exerted by the form rollers, and therefore whether or not adjustment is required, it was heretofore necessary to stop the press and by means of three layered slip-sheets inserted between the rollers and plate cylinder observe the ink impression thereon. Such a method for determining the pressure is inaccurate, unreliable and costly in that it requires the efforts of two mean and a stoppage of printing. Alternative methods for setting the pressure have been equally unsatisfactory.

The use of recently developed thin wrap-around printing plates has necessitated a greater degree of precision in distributing the ink from the form rollers onto the printing plate cylinder. The thin printing plate comprises raised printing surfaces and shallow non-printing areas between these surfaces. It is the function of the form rollers to distribute ink on the raised printing surfaces only. It would be highly objectionable to deposit ink on the non-printing areas because of the possibility of transferring this ink to the paper in areas which are not intended to have print.

Since it is the pressure of the form rollers exerted on the printing plate cylinder which determines the amount of ink deposited thereon and whether or not any ink will be deposited in the non-printing areas it is necessary especially when using the thin plates, to precisely set and regulate that pressure so as to make sure that no ink is deposited in the shallow non-printing areas.

Heretofore, the use of thicker plates did not present as great a danger of transferring ink from the non-printing areas to the paper because the non-printing areas on the thick plates are much deeper than on the thin plate. Consequently, the degree of precision in setting and maintaining the pressure of the form roller on printing plate cylinder was not as critical when using the thick plates. The prior art devices have been unsuccessful in obtaining the precision pressure adjustment now required for printing with thin plates.

It is therefore an object of this invention to provide a means to achieve a high degree of precision adjustment of the form roller sockets, and to do so without stopping the press.

Anther object of this invention is to provide a device whereby the operator of the press can set the form rollers to the proper pressure adjustment on the printing plate cylinder by means of visual indicator means.

Another object of this invention is to provide means for visually indicating whether or not adjustment of the form rollers is necessary without waiting to see if too much or too little ink is distributed on the printed paper, and then to adjust the roller sockets to a desired setting by use of a visual means.

Various other objects and advantages will become apparent from the following description, and the novel features will be pointed out hereinafter in the appended claims.

Brief description of the drawings

In the drawings:

FIG. 1 is a schematic side elevational view of a magazine press ink motion to which the present invention may be applied;

FIG. 2 is an enlarged detail of Box **2** in FIG. 1;

FIGS. 3 and 4 are views of FIG. 2 as seen along arrow A and partially broken away;

FIG. 5 is a section along line **5—5** of FIG. 2;

FIG. 6 is a section along line **6—6** of FIG. 5;

FIG. 7 is a view of FIG. 4 showing one feature of the present invention; and

FIG. 8 is a somewhat schematic elevational view of FIG. 7.

Description of the preferred embodiment of this invention

The present invention as shown and described herein may be applied to ink motions of various arrangements. The particular embodiment as shown and described herein however, is for particular use in the typical magazine press unit. The ink motion of such a unit is schematically shown in FIG. 1 with the frame **101** carrying the ink motion being so mounted as to be rolled away from impression cylinder **103**.

This invention is primarily concerned with a mechanism for adjusting a single form roller. However, since all ink motions commonly used are supplied with a plurality of form rollers, and since it is common practice to have two form rollers transfer the ink from a single ink drum to the printing plate cylinder the preferred embodiment of this invention will now be described with reference to a mechanism for adjusting a pair of form rollers.

As seen in FIG. 3 a reciprocating ink drum **104** is carried between frames **101** and **102** supported by bushings **105** and **106**. The shaft **150** of the drum **104** passes through the bushing **105** and frame **102** for connection with a mechanism for causing reciprocation of the drum, which is not shown in the drawings and not needed for an understanding of the present invention. The form rollers **107** and **108** which transfer the ink from the reciprocat-

without affecting the pressure adjustment of the near side. This can be accomplished by sliding knob **161** to a third position such that neither the keys **162** are in engagement with keyways **167**, nor are gears **163** and **165** in mesh. When the knob is in this position a pin wrench not shown, can be inserted into bore **160** of collar **157** and only shaft **123** can now be rotated by manually moving the inserted pin wrench through the desired angle. When only shaft **123** is rotated, only socket **111** will be adjusted.

A dial indicator **168** is rotatably mounted around collar **156** for the purpose of obtaining a precise pressure setting for the form roller. A pointer **169** is secured to the dial indicator by means of screw **182**. A dial face **170** is fixed to frame **145** by means of screw **171**. The dial face is provided with markings to indicate the amount of flat which is desired. The "0" marking will indicate merely surface contact of the form roller with the printing plate cylinder. When a larger flat is required, one of the markings other than "0" as for example ⅛", ¼" or ⅜" will be used as a guide. Secured to dial indicator **168** by means of pin **181** is a spur gear **172** which meshes with spur gear **173** which is attached to a block **174** by means of bolt **175**. Block **174** is rotatably mounted about pivot pin **180** which passes through frame **145**. Pivotally mounted about pin **180** is pivot bar **176**. Pivot bar **176** is provided with pin hole **149**, and block **174** is provided with pin holes **178** and **179**. Pin hole **178** on block **174** is aligned with pin hole **149** on bar **176**. A setting pin **177** can be inserted through pin holes **149** and **178**. A stop pin **183** is set in frame **145**.

In order to precisely set the form roller to the desired flat, knob **161** should first be set into its second position so that both shafts **123** and **125** can be rotated simultaneously. With the knob in this position it should be rotated in a counterclockwise direction. This will cause dial indicator **168** and gear **172** to rotate with the knob, because pointer end **195** of key **162** will engage a serrated edge **194** on dial indicator **168**. Consequently, gear **173** will rotate in a clockwise direction. With setting pin **177** inserted in pin holes **149** and **178** marked "BACK OFF," block **174** and pivot bar **176** will also rotate in the clockwise direction. Knob **161** should be continued to be turned until setting pin **177** hits stop pin **183**. Pointer **169** will now indicate on dial face **170** that the form roller is in its back off position. Form roller **107** will now be at its maximum position away from printing plate cylinder **109**.

The operator of the press will follow this procedure on all the form rollers so that none of them will be in contact with the printing plate cylinder. This now allows the operator to set each form roller into proper flat arrangement with its respective reciprocating drum by adjusting the eccentric setting (as shown in FIG. 2) of the form roller's shaft.

Once the form rollers are set with respect to the reciprocating drum the operator will now set the form rollers into proper flat on the printing plate cylinder by means of the present invention. This will be accomplished by turning the knob **161** in a clockwise direction to its original position. The pointer **169** will now point to the "0" reading on the dial face **170**. This will indicate that the form roller **107** is now in initial surface contact with the printing plate cylinder **109**, but without exerting a pressure thereon. In order to now precisely set the form roller to the exact flat relationship or pressure exertion on the cylinder **109** the operator will remove setting pin **177** from pin hole **178** and place it in pin hole **179** which is marked "MAX. FLAT" on a plate **196** affixed to gear **173**. Knob **161** can now be rotated in a clockwise direction resulting in a counterclockwise movement of gear **173**, block **174** and setting pin **177**. When setting pin **177** hits stop pin **183** the form roller will be in its most accepted maximum flat position on the printing cylinder which corresponds to ⅜" flat. The pointer **169** will therefore point to the ⅜" mark on the dial face **170**.

The amount of flat required or desired by a particular press will depend on many factors including type of ink, type of press, experience of the operator, etc. If the operator determines that the flat setting should be other than ⅜" he can simply turn the knob **161** in a counterclockwise direction until the pointer **169** points to whatever setting is desired, for example ⅛" or ¼" or anywhere between 0" and ⅜". This will result in a rotation of shafts **123** and **125** in a counterclockwise direction and will consequently cause form roller **107** to back off from printing plate cylinder **109** until the desired flat is obtained. The setting pin will remain in the MAX. FLAT pin hole **179** during operation of the press. If the pressman observes that the quality of print requires a further adjustment of the flat he can turn knob **161** to whatever new setting he desires without stopping the press. As described above it is sometimes desirable to adjust only one side of the form roller. This can be accomplished as already described, by sliding the knob **161** into one of its other two positions. For example with the knob in the position as shown in FIG. 5 where only the keys **162** are in engagement with keyways **167** on collar **156**, only shaft **125** will be rotated by turning knob **161** thereby adjusting only the near side of form roller **107**. Or, the knob can be slid into its third position and only shaft **123** can be rotated by turning a pin wrench inserted in bore **160** on collar **157**, thereby adjusting only the far side of form roller **107**.

Form roller **108** can be adjusted by means of its shaft rotating mechanism which is identical with the mechanism as above described.

FIGS. 7 and 8 schematically show the above described mechanism with a feedback system for determining and indicating to the operator whether or not the form roller requires adjustment. Gear **173** can be fitted with a shaft **184** which extends through frame **101** supported therein by bearing **191**. On the other side of frame **101**, shaft **184** is attached to a pivot arm **186** by means of pin **190**. Attached to the other end of pivot arm **186** there is a shaft **188** of a detector **187**. This detector can either be a nylon roller or merely a curved surface which will sit on and ride freely on the form rollers. Torsion spring **185**, secured at one end thereof to frame **101** and at its other end to pivot arm **186**, urges the pivot arm, and consequently the detector toward the form roller.

As a result of possible swelling or wear of the form roller the detector and the pivot arm **186** will swing in the direction of the radial component of the expanding or shrinking form roller. The rotation of shaft **184** will rotate through a corresponding angle and will cause gear **173** to rotate through the same angle. As a result, gear **172** will cause pointer **169**, mounted on dial indicator **168**, to shift from its original setting. The operator, realizing that the pointer has shifted from the position he originally set it at, will know that the form roller has swelled and he will therefore proceed to readjust the setting of the form roller flat without having to stop the press by turning knob **161**, in any of its three sliding positions, until he is satisfied with the new setting.

What is claimed is:

1. A socket adjustment device for precisely adjusting the position of form rollers of a rotary printing machine ink motion comprising:

a pair of levers, each pivotally mounted at one end thereof about one of two end bushings concentrically supporting a reciprocating ink drum of the ink motion;

a roller socket supported at the other end of each of said levers for supporting therebetween a form roller located between said ink drum and a printing plate cylinder;

a helical gear segment attached to each of said levers;

first and second screw pinions having helical teeth on its periphery for meshing with said gear segments for causing rotation of each gear segment so as to

pivot said levers about its respective bushing thereby adjusting the position of said roller socket;

shaft means supported between the frames of the printing machine with its axis being parallel to the axis of the form roller for carrying said screw pinions;

a mechanism mounted at one end of said shaft means for rotating said shaft means; and

means mounted on the frames of the printing machine for preventing rotation of the screw pinions as the shaft means rotates and for limiting the movements of the screw pinions to axial displacement on the shaft means so as to cause rotation of their respective gear segments attached to said levers thereby adjusting the position of the roller sockets.

2. The socket adjustment device according to claim 1 wherein said shaft means comprises:

a hollow shaft having a threaded portion for carrying said first screw pinion, said hollow shaft extending only part way between the frames;

a solid shaft carried within the hollow shaft and extending between both frames, said solid shaft having a threaded portion on its exposed part for carrying said second screw pinion; and wherein

said mechanism for rotating said shaft means is adapted to rotate said hollow shaft and said solid shaft either simultaneously or individually so as to cause axial movement of said first and second screw pinions either simultaneously or individually whereby the roller sockets may be adjusted either simultaneously or individually.

3. The socket adjustment device according to claim 2 wherein said mechanism for rotating the shaft means comprises:

a knob slidably and rotatably mounted on the end of said solid shaft having three sliding positions;

a plurality of keys mounted on said knob;

a first collar mounted on said hollow shaft having a plurality of keyways for meshing with said keys when said knob is slid into a first position so that only said hollow shaft can be rotated as the knob is turned;

an internal gear secured to said knob;

a second collar mounted on said solid shaft having a gear for meshing with said internal gear when said knob is in a second position and said keys are also in engagement with said keyways so that both said hollow shaft and said solid shaft can be rotated as the knob is turned; and

said second collar also having a radially extending bore for receiving a pin wrench when said knob is in a third position with neither said keys or gears in engagement so that only said solid shaft can be rotated by means of said pin wrench.

4. The socket adjustment device according to claim 3 further comprising a visual setting indicator mounted at the end of said shaft means and geared to the rotation of said knob so that when the knob is rotated the indicator will indicate the proper position of rotation of the shaft means for proper precise adjustment of the form roller.

5. A socket adjustment device for precisely adjusting the position of form rollers of a rotary printing machine ink motion comprising:

at least one pair of levers, each lever of a pair pivotally mounted at one end thereof about an end bushing concentrically supporting a reciprocating ink drum of the ink motion whereby each of said supporting bushings supports at least one lever;

a moveable roller socket supported at the other end of each of said levers for supporting a form roller between each of said pairs of sockets, each of said rollers being positioned between said ink drum and a printing plate cylinder;

a helical gear segment secured to each of said levers;

a solid shaft carried in a hollow shaft having a portion thereof extending beyond the end of said hollow shaft, said shaft combination being provided for each pair of levers and having its axis parallel to the axis of said form rollers;

a first screw pinion carried on a threaded portion of each of said hollow shafts for axial displacement as said hollow shaft rotates, said first screw pinion having helical teeth on its periphery for meshing with the gear segment attached to one lever of a pair of levers thereby pivoting said lever about its support bushing so as to adjust the position of the roller socket carried by said lever;

a second screw pinion carried on a threaded portion on the extended part of each of said solid shafts for axial displacement as said solid shaft is rotated, said second screw pinion having helical teeth on its periphery for meshing with the gear segment attached to the other lever of the pair of levers thereby causing said other lever to pivot about its respective support bushing so as to adjust the position of the roller socket carried by said other lever; and

a mechanism mounted at the end of each set of shaft combinations for rotating said hollow shaft and said solid shaft either simultaneously or individually to thereby adjust each roller socket carried by one pair of levers either simultaneously or individually.

6. The socket adjustment device according to claim 5 wherein said mechanism for rotating said hollow and solid shafts comprises:

a knob slidably and rotatably mounted on the end of each of said shaft combinations having three sliding positions;

a plurality of keys mounted on each of said knobs;

a first collar mounted on each of said hollow shafts having a plurality of keyways for meshing with said keys when said knob is slid into a first position so that only said hollow shaft can be rotated as the knob is turned;

an internal gear secured to each of said knobs:

a second collar mounted on each of said solid shafts having a gear for meshing with said internal gear when said knob is in a second position and said keys are also in engagement with said keyways on said first collar so that both said hollow shaft and said solid shaft can be rotated as the knob is turned; and

each of said second collars also having a radially extending bore for receiving a pin wrench when said knob is in a third position with neither said keys or said gears in engagement so that only said solid shaft can be rotated by means of said pin wrench.

7. The socket adjustment device according to claim 6 further comprising a feedback system for indicating whether each form roller is out of flat and requires adjustment.

8. The socket adjustment device according to claim 7 wherein said feedback system comprises:

a detector resting on the form roller for following variations in the diameter of the form roller;

an indicator mounted on the shaft combination for indicating the relative movement of the detector; and

means connecting the indicator with the detector for transmitting the movements of the detector in response to swelling or wear of the form roller to the indicator.

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United States Patent Office 3,440,959 Patented Apr. 29, 1969

3,440,959

COATED POLYMER

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No Drawing. Continuation-in-part of application Ser. No. 528,418, Feb. 18, 1966. This application Dec. 14, 1966, Ser. No. 601,577

Int. Cl. B41n *1/00, 3/00*

U.S. Cl. 101—453 8 Claims

ABSTRACT OF THE DISCLOSURE

Coated polymers, comprising polyolefins, polystyrene, styrene copolymers, blends of polystyrene with styrene-butadiene copolymers, poly(vinyl chloride) poly(vinylidene chloride), vinyl chloride-vinylidene chloride copolymers, and poly[bis(chloromethyl) oxetane] coated with a thin layer of silicon monoxide and, which, in the form of sheets, are useful as lithographic plates. The said coated polymers may be prepared by vacuum depositing a coating of silicon monoxide of from about 3×10^{-6} inch to about 40×10^{-6} inch on the surface of the polymer.

This is a continuation-in-part of my copending application Serial No. 528,418 filed February 18, 1966, now Patent No. 3,394,200.

As stated above, this invention relates to certain specific polymers coated with a thin layer of silicon monoxide and to a process for preparing said coated polymers which comprises vacuum depositing a thin coating of silicon monoxide on their surface.

Polyolefins, polystyrene, styrene copolymers, blends of polystyrene with styrene-butadiene copolymers, poly (vinylidene chloride), vinyl chloride-vinylidene chloride copolymers, poly(vinyl chloride) and poly[bis(chloromethyl) oxetane] are well known for their ability to be formed into films, sheets, bottles, tubing and other useful articles. However, all of these polymers suffer the disadvantage of picking up static electrical charges, permeability to gases, being difficult to print upon and relatively nonadherent to coatings.

It has now been discovered that the said specific polymers can be made anti-static, less permeable to gases, more receptive to printing and adherent to coatings by vacuum depositing a very thin layer of silicon monoxide on their surface. Quite surprisingly, it has been found that silicon monoxide forms a chemical bond when vacuum deposited on one of the specific polymers listed above but not when vacuum deposited on other polymers such as poly(ethylene terephthalate), polyacetal resin or capran polyamide. The said bond is so tight that when a rupture occurs the failure is in the polymer and not between the polymers and the silicon monoxide coating.

The specific polymers which can be coated in accordance with this invention are the stereoregular polyolefins such as linear polyethylene, stereoregular polypropylene, crystalline ethylene-propylene copolymers, crystalline ethylene-1-butene copolymers, crystalline propylene-1-butene copolymers, crystalline isoprene-propylene copolymers, etc.; polystyrene; styrene copolymers including terpolymers such as acrylonitrile-butadiene-styrene terpolymers; blends of polystyrene with styrene-butadiene copolymers; poly(vinyl chloride); poly(vinylidene chloride); vinyl chloride-vinylidene chloride copolymers; poly[bis(chloromethyl) oxetane] and blends of these polymers with each other. The polymers can, of course, contain additives such as extenders, fillers, dyes, stabilizers, reinforcing materials, etc., but the presence or absence of such additives is immaterial to the invention. While polymers of various

shapes and sizes can be coated in accordance with this invention, most preferably the polymers will be in the form of sheets or films. In some cases, it may be desirable to orient the sheet or film by methods known in the art.

The vacuum deposition of the silicon monoxide onto the surface of the said polymers can be carried out using any of the well-known vacuum deposition procedures. The thickness of the coating will be from 3×10^{-6} inch, to about 40×10^{-6} inch, most preferably from about 8×10^{-6} inch, to about 30×10^{-6} inch. The thickness can be controlled by the temperature, the distance of the polymer from the source and the period of deposition. In general, pressure within the vacuum chamber during deposition will be maintained at about 5×10^{-4} millimeters of mercury or less, and the period of deposition will vary with the temperature and the distance of the polymer from the source. If the silicon monoxide coated polymer is to be stored for any length of time, it is usually desirable to apply a protective coating to prevent oxidation or the absorption of materials on the surface. One method of protective coating is simply to dip the coating polymer in an aqueous solution of carboxymethylcellulose and then allow it to dry. Such a coating can easily be washed away before the coated polymer is to be used.

The coated polymers of this invention are particularly useful as flexible, inexpensive, light-weight lithographic plates, provided the sheet is smooth and the silicon monoxide coating is of the proper thickness. More specifically, the requirements are (1) that the surface of the polymer sheet have no perceptible roughness and (2) that the silicon monoxide coating be of a thickness of from 3×10^{-6} inch to about 40×10^{-6} inch. The thickness of the polymer sheet is not critical but will, in general, be at least about 3 mils and should preferably be uniform to within $\pm10\%$ variation. In certain cases it may be desirable to pigment the sheet. For example, such pigmentation can be used to furnish a contrasting color for the diazo image layer and to reduce halation. As stated above, one requirement is that the sheets be smooth (i.e. have no perceptible roughness). Smoothing of the sheets can be effected by various methods well known in the art as for example calendering, press polishing, molding between smooth plates, extruding onto polished quench rolls, etc.

The lithographic plates of this invention can readily be converted into either positive or negative working plates. For example, a negative working plate can be obtained by coating with a photo resist and exposing through a negative transparency so as to render the photo resist insoluble and oleophilic in the exposed areas. When the non-exposed image is dissolved away, the hydrophilic silicon monoxide surface is laid bare and a negative working plate results. A positive working plate can be made by coating with a photo resist, exposing through a positive transparency and removing the unexposed (soluble) resist as described above to reveal the silicon monoxide coating. By etching away the silicon monoxide coating, the oleophilic area is revealed. Then the exposed (hardened) photo resist is removed, exposing the hydrophilic silicon monoxide surface as a positive working plate. It is also possible to coat a plate with a photo resist containing a material which releases hydrogen fluoride (such as a diazofluoborate) when exposed to light. Such a photo resist would automatically etch through the silicon monoxide coating on exposure thus eliminating a step in the development process.

The following examples are presented for purposes of illustration, parts and percentages being by weight unless otherwise specified.

Example 1

A silicon monoxide coated polypropylene lithographic plate was prepared as follows. An extruded sheet of 0.015

inch thick crystalline polypropylene having a molecular weight of 600,000 was cut into a 10 x 16 inch plate and press-polished until there was no visual evidence of surface flaws.

The smooth polypropylene plate was then placed in a vacuum chamber equipped with five electrically heated tungsten filaments. The plate was mounted in an approximate arc around the filaments at a distance of 10–12 inches. Each filament heated a sample of silicon monoxide to its vaporization temperature and was fired independently in series. Deposition time was approximately 2 minutes per filament. The chamber was subjected to a vacuum of 4.5×10^{-4} mm. during the process. The resulting plate had a 15×10^{-6} inch coating which was scratch and abrasive resistant.

The silicon monoxide coated lithographic plate was converted to a printing plate by coating with a commercial ink-receptive diazo resin coating. After exposure through an image-bearing transparency and development of the plate, 10,000 copies were run on a lithographic printing press. The resulting prints were of excellent quality. The plate was examined and found to be undamaged, the coating still adhered tightly to the polypropylene substrate.

Example 2

A sheet of 0.01 inch thick linear, high-density, polyethylene having a molecular weight of approximately 150,000 was cut into a 10 x 16 inch plate and press-polished as described in Example 1. The smooth plate was then coated with a 20×10^{-6} inch layer of silicon monoxide using the method described in Example 1. The resulting lithographic plate was converted to a printing plate by coating with a commercial ink-receptive diazo resin coating and imaged as described in Example 1. The printing plate was used to print 20,000 copies on a lithographic printing press. The prints were of excellent quality and the plate was undamaged.

Example 3

The polypropylene sheet described in Example 1 was press-polished and coated with a 5×10^{-6} inch layer of silicon monoxide using the method described in Example 1.

The resulting lithographic plate was converted to a printing plate by coating with a commercial ink-receptive photo resist. After exposure through a positive transparency, the water soluble background areas were removed. The plate was then immersed in 0.75% aqueous hydrofluoric acid for three minutes to etch away the silicon monoxide coating, exposing an oleophilic area. Finally, the hardened resist was removed with an organic solvent exposing the hydrophilic silicon monoxide coating. The resulting positive working plate functioned satisfactorily during a run of 10,000 prints. The plate was examined and found to be undamaged.

Example 4

A sheet of 0.02 inch thick crystalline ethylene-propylene copolymer having a molecular weight of approximately 600,000 and containing 5 mole percent ethylene was cut into a 10 x 16 inch plate and calendered until there was no visual evidence of surface flaws. The smooth plate was then coated with a 12×10^{-6} inch layer of silicon monoxide using the method described in Example 1.

The resulting lithographic plate was converted into a printing plate by coating with a commercial ink-receptive photo resist. After exposure through a negative transparency, the water soluble areas were removed exposing the hydrophilic silicon monoxide coating. The resulting printing plate was used to print 15,000 copies on a lithographic printing press. The prints were of excellent quality and the plate was undamaged.

Example 5

A silicon monoxide coated poly[bis(chloromethyl)-oxetane] lithographic plate was prepared as follows. An extruded sheet of 0.02 inch thick poly[bis(chloromethyl)-oxetane] having a molecular weight of 270,000 was cut into a 10 x 16 inch plate and calendered until there was no visual evidence of surface flaws. The smooth plate was then coated with a 4×10^{-6} inch layer of silicon monoxide using the method described in Example 1.

The resulting lithographic plate was converted into a printing plate by coating with a commercial ink-receptive photo resist. After exposure through a negative transparency, the water soluble areas were removed exposing the hydrophilic silicon monoxide coating. The resulting printing plate was used to print 15,000 copies on a lithographic printing press. The prints were of excellent quality and the plate was undamaged.

Example 6

A silicon monoxide coated poly(vinyl chloride) film was prepared as follows. A 1 mil film of poly(vinyl chloride) having specific viscosity of 0.4 as measured by ASTM D–1243–52T was coated with a 5×10^{-6} inch layer of silicon monoxide using the method described in Example 1.

The resulting coated film and an uncoated control were tested for gas permeability according to ASTM D-1434. The results are tabulated below:

	Cc./sq. m./24 hrs./atm.		
	O_2	CO_2	N_2
Uncoated control	120	320	20
Coated film	78	175	(1)

[1] None after 8 hours.

Example 7

A silicon monoxide coated polystyrene sheet was prepared as follows. A 10 mil sheet of polystyrene having a molecular weight of approximately 300,000 was coated with a 3×10^{-6} inch layer of silicon monoxide using the method described in Example 1.

The resulting coated sheet and an uncoated control were tested for antistatic properties. Each sheet was charged with 1000 volts of static electricity and then the time measured for the charge to dissipate. The results are tabulated below:

	Relative humidity at 80° F., percent	Volts after a period of 5 minutes	Half life [a]
Uncoated control	47	900	Too long to measure.
Coated sheet	47	10	45 seconds.
Uncoated control	12	930	Too long to measure.
Coated sheet	12	65	75 seconds.

[a] Time in seconds for charge to dissipate to 500 volts.

Example 8

A silicon monoxide coated polypropylene film was prepared as follows. A 2 mil film of crystalline polypropylene having a molecular weight of 600,000 was coated with a 6×10^{-6} inch layer of silicon monoxide using the method described in Example 1.

The resulting coated film and an uncoated control were tested for printability by marking with a commercial flexographic ink (polyamide type). After allowing the ink to dry for one hour the marked surfaces were rubbed with a cotton cloth. The mark on the coated film could not be rubbed off, while the mark on the uncoated control was easily removed by rubbing.

Example 9

A silicon monoxide coated lithographic plate was prepared from a 0.02-inch thick extruded sheet of a blend of polystyrene and styrene-butadiene copolymer. The polystyrene had a molecular weight of approximately 300,000 and amounted to 90% of the blend. The styrene-butadiene copolymer had a molecular weight of 300,000 and contained approximately 28% of styrene monomer.