June 12, 1951 E. H. AFFOLTER 2,556,511

PROCESS FOR MAKE-READY

Filed April 21, 1949

Fig. 1

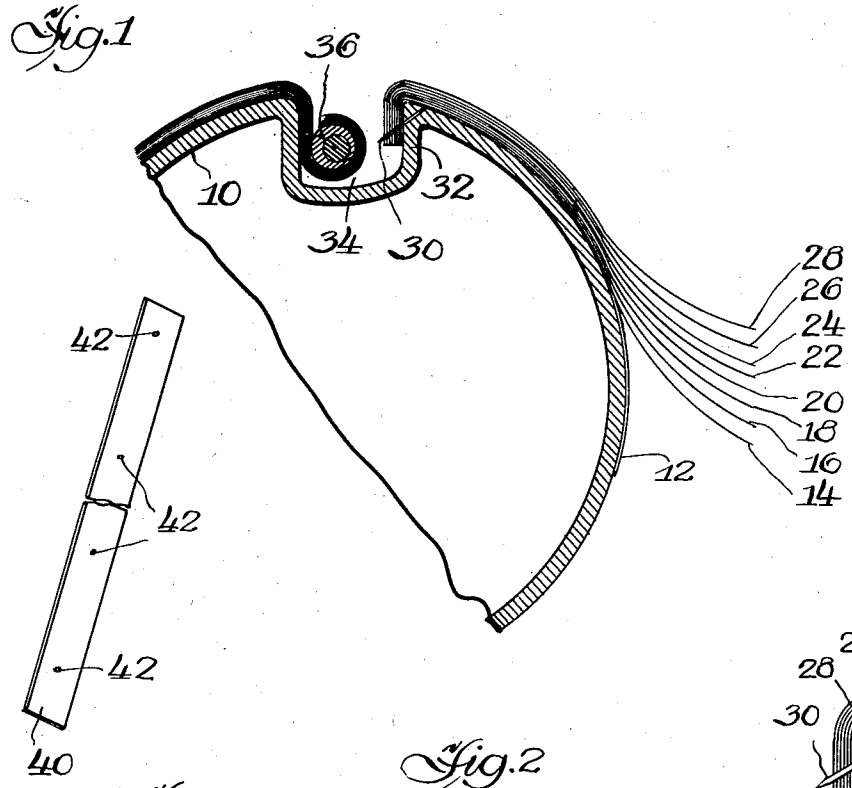


Fig. 2

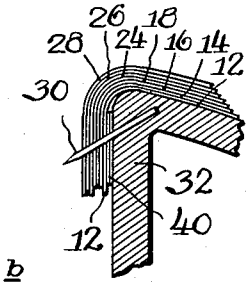


Fig. 4

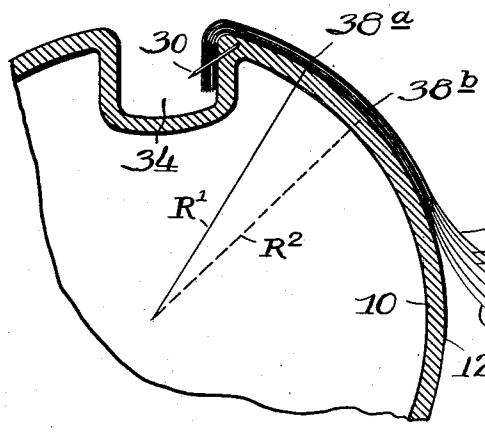


Fig. 3

Fig. 6

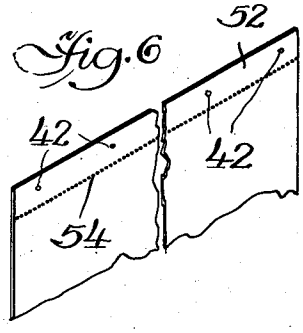
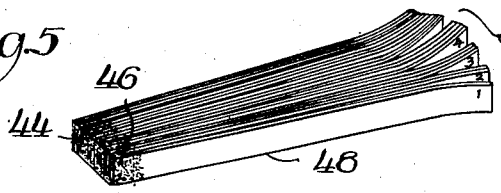


Fig. 5



INVENTOR.
Earl H. Affolter,
BY T. B. Sliz
Atty.

Patented June 12, 1951 2,556,511

UNITED STATES PATENT OFFICE

2,556,511

PROCESS FOR MAKE-READY

Earl H. Affolter, Chicago, Ill.

Application April 21, 1949, Serial No. 88,821

4 Claims. (Cl. 101—401.3)

1

This invention is directed broadly to the art of producing a suitable impression receiving base particularly useful in the cylinder type and color rotary printing presses. More particularly it pertains to the improved process of attaching a "make ready" sheet to cylinder type printing presses.

The conventional impression receiving cylinder in a rotary type printing press consists of a heavy metallic roller or drum with its surface machined accurately and highly polished to form a smooth curvilinear and radially spaced accurate circumferential surface. Ordinarily two opposite portions of the circumferential cylindrical surface are grooved transversely to form therein recess as within the interior of said drum. The transverse groove generally contains therein a spindle and a clamping device which holds a number of layers of various materials about the circumference of the cylinder. The end or ends preferably of the outermost layers of such materials are fastened to the spindles within the recess and after encompassing the drum are retained in a reel placed in the same recess within the drum. The reels carrying the ends are capable of being tightened to any desired degree by means of a device such as a ratchet and pawl arrangement. If the drum is large it may have two or more grooves to contain the spindle and reel devices to fasten the sheets in place.

Normally, the first layer over the metal is a hard base sheet retained in place about the cylindrical surface by means of the aforesaid clamp and reel devices. Another layer generally of hard paper known as a felt sheet is placed over the hard sheet to provide a base with a certain amount of resiliency and give but that still remains very firm. Over this are now placed packing sheets generally between three to seven in number which are used subsequently in the actual preparation of the "make ready." A so-called shrink sheet consisting of stout paper is now placed in the same manner over all of the other sheets to draw together the underlying layers to form a mat or laminated structure of uniform thickness. This mat is very uniformly and accurately spaced radially about the circumference over which the impression sheet is to be placed. This is extremely important for the slightest variation or shift in the position of these layers acting as a base for the impression or image receiving sheet will throw out of register any printing job running through the press. In addition, any variation in thickness will also

2

cause a corresponding difference in the peripheral speed and cause blurring or offset. The importance of this condition cannot be overemphasized for it is the fundamental surface and base on which the so called "overlays" or "make ready" sheets are placed.

The roll with the packing and shrink sheets in place is now ready to receive the "draw sheet" or a sheet of paper upon which an impression or image of the printed characters from the type cylinder or offset roll is made.

The draw sheet with its impression is removed from the press and prepared into customary overlays to be placed on the cylinders of the printing press. This is accomplished by obtaining an image or impression on the top sheet of the laminated mat. Before the overlay is inserted under the impressed sheet, a number of so called register marks or "stab" marks as known by craftsmen are made in the top image impressed sheet to provide an exact register or alignment indicia upon all of the underlying sheets, which include overlays. The overlay which is ready for placing into the assembly is now inserted into exact alignment with the "stab" marks on any of the packing sheets. It is customarily glued into exact position. The overlay is substituted for one of the lowermost packing sheets which are generally of the same thickness as the overlays. The other sheets are now replaced and covered with the top image sheet. If the overlay is properly placed, all of the sheets will be in alignment and exact register. The cylinder with the entire laminated mat containing the corrected overlay is now ready for the production run. When properly prepared, the cylinder will have a surface corrected for all irregularities in the type cylinder so that a uniformly dense and even ink impression is obtained on the draw sheet.

In the process of preparing the "make ready," the inserts or overlays are spotted to correct inaccuracies in the impressions of printed image. The high and low spots as well as defects are marked with a pencil and either removed or built up if necessary. In the course of such corrections, one or more of the packing sheets may be affected and sections thereof may be built up or cut out or even entire packing sheets may be removed in order to have a printed image on the draw sheet with a uniform distribution of ink over the entire draw sheet. When the corrections are inserted, another test draw sheet is made to determine the efficacy of the corrections. This process is repeated so many times until the

proper and uniform distribution as well as concentration of ink is received by the test draw sheet. When this is accomplished, the cylinder with its "make ready" is now ready for the printing production run.

It is clear that during the process of "making ready" one or more packing sheets will be removed or destroyed. Every time a sheet is removed, there is a difference in the relative radius of the outermost and removed layer in relationship to the underlying layer. Thus in the course of making ready the removal of several thicknesses of sheets will cause the image to shift laterally on the periphery of the final assembly and become blurred because the circumferential or surface linear speed of the impression cylinder will be generally somewhat slower than the peripheral speed of the offset or plate cylinder. Errors of this type become cumulative and though correctable are time consuming, wasteful of paper and costly. Further errors of this type are particularly noticeable in color press operations when exact register must be maintained between the different ink cylinders to obtain a true blend and match.

It therefore is an object of my invention to provide an improved process of making ready whereby the peripheral congruency of multiple roller presses will be retained to provide exact register as it is particularly applied to color printing.

Another object of my invention is to provide a process for making ready whereby the same overall lateral circumferential position is maintained at all times regardless of the number of layers of packing sheets that may be peeled off.

A still further object of my invention is to provide an improved process for making ready in an economical manner and to otherwise improve results in the art of printing.

Another and additional object of my invention is to provide a means by which the above objects can be attained economically and without any expensive alteration of present costly printing presses particularly used in color printing.

These and other objects, adaptations, variations, modifications and extensions will be clearly apparent to those skilled in this art in view of the clear and accurate description given hereinbelow of the preferred embodiment of my invention and the fundamental concepts underlying the principles involved in the same and whose preferred embodiment is illustrated for exemplary purposes only in the attached drawings forming a part of this specification.

In the drawings:

Figure 1 shows in section, partly broken away, the cylinder with the sheets in place.

Figure 2 shows an enlarged vertical section partly broken away, of the cylinder with two of the packing sheets replaced by a draw sheet or make ready sheet.

Figure 3 shows an enlarged detail of the improved means in position.

Figure 4 shows a single strip of the improved means, while

Figure 5 shows the same in pad form.

Figure 6 shows another modification in which the sheets are perforated to provide easier tearing off of the sheet from the roll.

In the drawings the reference characters designating specific elements therein also are used below to identify the same elements.

In preparing a make ready a drum or cylinder **10** of a cylinder printing press is covered successively with a rubber mat **12**, a felt layer **14**, a winder sheet **16**, the latter generally made of stout paper and a desired number of packing sheets such as **18**, **20**, **22**, **26**, etc., as well as the shrink sheet **26**. The latter sheet is placed over all of the others to hold all layers in position during the taking of the impression for make ready. Upon this bed of sheets is then placed a draw sheet **28** upon which the printing impression is made. All of these layers **16**, **18**, **20**, **22**, **24**, **26** as well as the draw sheet **28** are forced on the spindles or pins **30** which protrude angularly from the side **32** within the recess **34** formed in the outer periphery of the drum **10**. These sheets in the larger cylinder type machines generally encompass half of the outer periphery of the drum **10**, though in the illustration only one recess is shown in which the ends of the sheets are placed in a reel **36** located in the said recess **34**. The reel **36** has a means thereon such as a pawl and ratchet (not illustrated) device or any clamping means to take up any slack in the sheets and thereby produce a smooth surface upon which the draw sheet or the sheet upon which the printing is impressed can be placed to receive the impression of the printed characters. All of this assembly is illustrated in Figure 1.

After the draw sheet **28** has received its type impression, it, together with the shrink sheet **26** is removed from the cylinder and prepared into an overlay by the conventional methods described hereinabove. In removing these sheets **28** and **26**, there is no need in my improved process to place any alignment indicia on the two aforementioned sheets or any of the other packing sheets remaining in position on the cylinder. The top packing overlay assembly sheet **24** together with the shrink sheet **26** are removed and replaced by the draw sheet **28** containing the printed impression. However, in the conventional process of make ready before the draw sheet and other sheets are removed, a number of stab marks as explained above are punched into the entire assembly of sheets so that the draw sheet **28** can be lined upon replacement in exact register with sheets **24**, **22**, **20**, **18**, etc. that may be corrected or otherwise moved about to bring out a uniform underlayment for the draw sheet in the printing operation. In my improved process the distortion caused by stab marks, humps caused by glue used in attaching the make ready to the shrink sheet, and other irregularities of the surface caused by disturbance of the underlying layers is entirely eliminated.

In the conventional process when a packing sheet layer such as **24** is removed and the draw sheet **28** substituted therefor, the register marks such as **38***a* shift laterally to a point such as **38***b*. Though for purposes of illustration, the diagrammatic Figure 2 shows an exaggerated shift of such marks for purposes of clarity, nevertheless, in actual practice such shift does occur to a sufficient degree to disturb seriously the register of the imprinted image. The reason for this shift in the register of the overlay is caused by the difference of the radius between the draw sheet **28** made on a larger diameter periphery and the diameter of the inner displaced packing sheet. Thus the marks shift to a new position and as more sheets are removed the shift of the marks is further and further from their original point **38***a*, so that eventually the degree of shift on the periphery will be the angle of displacement between the radii R^1 and R^2. It is apparent that in spite of care of the printing craftsman the marks **38** will shift and be out of register with the others

when one or more packing sheets 24, 22, 20, 18, etc. are removed in the process of preparing make ready.

In practicing my improved process of attaching make ready to the cylinder press, I first make a draw sheet 28 which is attached to the spindles 30. After the image impression is made on the draw sheet, 28, it together with shrink sheet 26 are removed from the spindle 30 and made into an overlay by the conventional method. After the overlay is completed, it contains in addition to the two sheets 28 and 26 all of their corrections. These are then substituted for two or more of the underlying packing sheets such as 24, 22, etc. The packing sheets 24, 22, etc. which are removed are preferably torn off and the perforated head lap 40 of each sheet is allowed to remain attached to the spindles 30 to act as a shim to retain the overlay sheets 28 and 26 in the same and exact lateral position 38a as originally taken when they were on the outside periphery.

If desired shims of same thickness as the removed packing can be used on the spindles 30 and the entire packing sheets including the head lap held on the spindles 30 can be removed.

I prefer however in practice in place of the perforated head lap to provide filler strips or shims which serve the same purpose and for this reason are numbered identically. These strips 40 have the same thickness as the removed packing sheets 24, 22, 20, 18, etc. so that when one or more of these sheets are removed, I replace the same with an equal number of filler strips or shims 40 or with an equal thickness of the same to compensate for the thickness of the removed sheets at the spindle 30 section of the printing drum 10. The filler sheets or strips 40 having exactly the same thickness as the replaced sheets, retain the remaining sheets on the drum and including the shrink sheet 26 as well as the draw sheet 28 in the same relationship and in perfect register with the impression as originally received thereon. There is no shift of the overlay laterally upon the surface of the drum 10.

As a matter of fact, with my improved system of make ready and with the use of my improved filler strips 40, there is no need to use the stab marks 38. In this manner, I not only save time in aligning since all layers 26, 24, 22, 20, 18, etc., must be aligned since they all depend on the position in the spindles 30. Likewise, I also save money in repairs and time since the felt layer 14 and the rubber composition sheet 12 or underlying sheets are frequently destroyed or injured greatly by the stab marks and therefore in time will require replacement.

The filler sheet 40 has holes 42 punched therein at intervals to correspond to the spacing of the spindles or pins 30 in the recess 34 of the drum 10. For convenience, I may mount several filler sheets 40 in a pad form 44 which is coated with a glue backing 46 of a stripable nature. Further, by marking each sheet with the thickness and numbering each series consecutively 44 with numerals 50, I can peel off as many as I need very readily and place the correct amount on the pins 30 when a corresponding number of packing sheets are removed.

I have also found it very convenient to use another modification of my invention which is within the fundamental concepts and spirit of my invention. Figure 6 shows a packing 52 having the longitudinal and lateral dimensions as well as the thickness of the packing sheets 18, 20, 22, 24, etc. In the upper part thereof are provided the

holes 42 for insertion on the pins 30. In addition, I provide closely spaced perforations 54 to facilitate the tearing off of the packing sheet from the drum recess 34 but at the same time permitting the filler strip 40 to be retained without disturbing the assembly by removing the entire make ready from the cylinder 10. As a matter of further convenience, the tops of these filler strip sheets can be also made into pads by the usual methods of bindery art.

In view of the above description as well as the illustrations showing the preferred embodiment of my invention, it is apparent that these can be varied widely by one skilled in this art and such variations, extensions, modifications and adaptations are considered to be within the scope and spirit of my invention as defined in the hereunto appended claims.

I claim:

1. An improved process for make ready for cylindrical press, comprising the steps of taking an impression of images from an image containing cylinder on a draw sheet passed through the nip of said image containing cylinder and press cylinder forcing said draw sheet against said image containing cylinder, placing the said draw sheet on a number of plies of paper to form a structure therefrom, correcting image inaccuracies of said draw sheet by building up or removing sections from said paper plies underlying said image inaccuracies to obtain a uniform image producing overlay from said structure, the said press cylinder having thereon a shrink sheet and a layer of packing sheets, said shrink and packing sheets attached by means of spindles to said cylinder, the said spindles lying in a transverse recess below the periphery of the press cylinder, and being perpendicular to the axis of said press cylinder whereby the various sheets attached to said spindles are curved about the edge of the recess as they are mounted about the said periphery, removing the shrink sheet and one or more packing sheets from said spindles, replacing said packing sheets with an equal thickness of sheets containing the said corrected image overlay on the said spindles, covering the said overlay with the said shrink sheet and attaching the said shrink sheet on the said spindles now containing an equal thickness of the overlay sheets in place of the removed packing sheets, folding the said overlay and shrink sheets over the edge of said recess and about the said cylinder and fastening the same to the press cylinder in juxtaposition whereby all the underlying sheets are in alignment to form an exact register when a draw sheet is passed through said cylinders to have an image printed thereon.

2. In the process of claim 1 whereby the said packing sheets to be replaced by the overlay are torn off on the periphery of said press cylinder about the edge of said spindle containing recess and without removal of stubs of said torn off packing sheets, positioning the said overlay in place of said packing sheets on the periphery and locking the said overlay in edge contacting juxtaposition with edges of said packing sheet stubs by means of said shrink sheet whereby exact register is obtained.

3. In the process of claim 1 whereby the said packing sheets to be replaced by the overlay are perforated along a line on the periphery of said cylinder parallel to edge of said recess, tearing out along said perforation the required amount of packing sheets in a thickness equal to the thickness of the overlay, replacing the said torn

out packing sheets with the overlay and locking said overlay in edge contacting juxtaposition with said perforated stubs remaining at edge of said recess by means of the shrink sheet.

4. In the process of claim 1 wherein the removed packing sheets are replaced with an equal thickness of filler strips placed on said spindles, the said filler strips having a length sufficient to lap over edge of said recess.

EARL H. AFFOLTER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
987,703	Curtin	Mar. 28, 1911
1,127,986	Green	Feb. 9, 1915
2,055,751	Robinot	Sept. 29, 1936
2,226,423	Bluestone	Dec. 24, 1940