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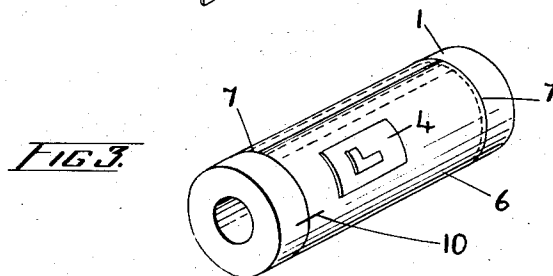
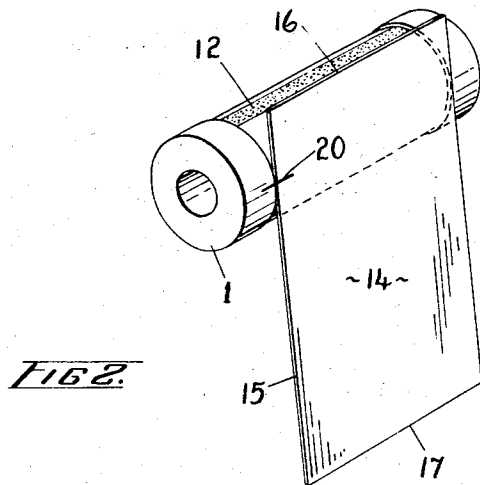
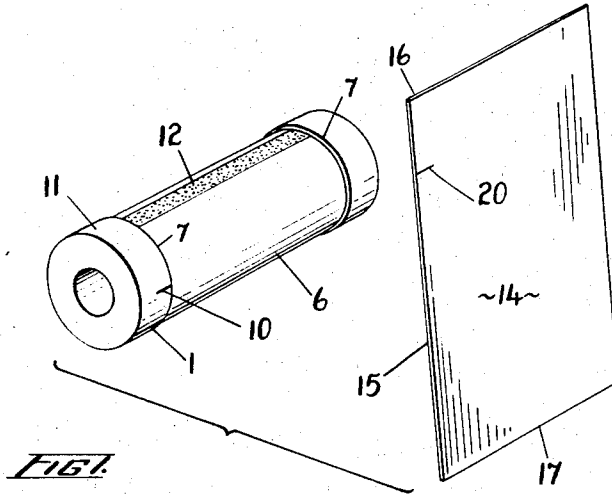
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3,358,598

METHOD OF MOUNTING PLATES TO PRINTING MACHINE CYLINDERS

Filed Jan. 27, 1966

2 Sheets-Sheet 1



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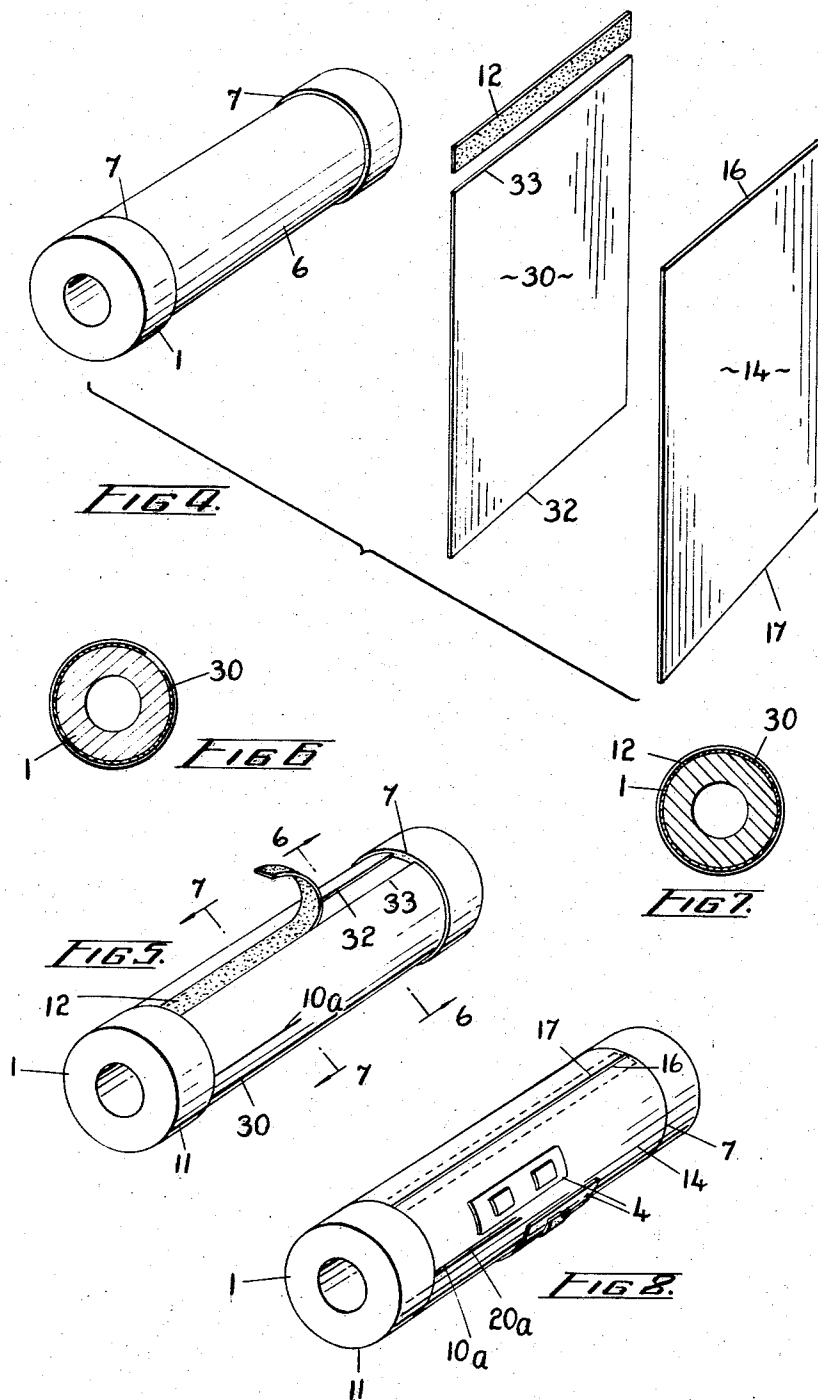
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METHOD OF MOUNTING PLATES TO PRINTING MACHINE CYLINDERS

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2 Sheets-Sheet 2



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3,358,598

METHOD OF MOUNTING PLATES TO PRINTING MACHINE CYLINDERS

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ABSTRACT OF THE DISCLOSURE

The method of detachably mounting printing plates on a printing machine cylinder wherein, initially, a base sheet is tightly wrapped around a major portion of the cylinder with a strip of adhesive inserted on the remaining minor portion of the cylinder to form a substantially even surface. Tightly wrapping a flexible but otherwise substantially undeformable backing sheet around the cylinder in releasably adhered relation therewith and mounting the actual printing plates in selective spaced relation on the backing sheet. The resulting assembly being then proved for proper alignment of the plates, such proving being followed by indexing of the backing sheet in registration with index means carried on the machine cylinder.

This invention relates broadly to the field of printing and more especially to procedures involved in preparing printing equipment in instances where batches of particular items are required to be produced from time to time.

More particularly, the present invention is directed to an improvement in the presently used methods of mounting rubber or similar printing plates on the rolls or cylinders of rotary-press printing machines. The invention herein disclosed also encompasses a new and novel printing plate assembly.

As will be well appreciated by those skilled in the art, rubber and/or synthetic rubber plates are considerably less expensive than other types. However, rubber plates pose a serious problem in use, especially in multi-colour operations, due to their susceptibility to distortion. For this reason, such plates are formed and mounted individually around the periphery of associated printing cylinders to avoid accumulation of distortion which would arise through successive interconnected plates.

Naturally, again referring to multi-colour operations, where a number of plates are mounted on a single cylinder, to print one colour, successive cylinders bearing plates for other colours must be very accurately aligned with respect to one another in order to produce the desired composite print. It is therefore obvious that "make-ready" times are considerable and present substantial overhead costs.

When one considers that each individual plate must be positioned on its associated cylinder; test or proving runs made; realignment effected and so on, it will be seen that, in instances where a specific printing operation must be repeated at spaced intervals of time, and such repetition is unavoidable in many businesses, a company must choose one of two courses of action.

Firstly, the company can purchase a very large number of cylinders such that an initial set-up may be stored for further use while a different cylinder assembly is used for another printing operation, or, secondly, the said company must accept the expense of repeated "make-ready" procedures.

The first course of action calls for a very substantial capital investment plus the necessity of utilizing valuable space for storage purposes.

The second course of action is, of course, just as objectionable as the first, for obvious economic reasons.

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It is known that efforts have been made from time to time in order to provide a simple and rapid means for mounting and dismounting plates without requiring immense capital outlay in equipment and storage space.

However, to this applicant's knowledge, no successful method or apparatus has heretofore been devised. As far as is known, most firms employed in printing and utilizing rotary-press equipment and rubber or like plates, still mount such plates directly onto the cylinders and remove a first set of plates on completion of one task to make way for a new set thus making the best use of a limited number of cylinders. Naturally, frequent mounting and removal of printing plates, especially rubber or similar plates, results in rapid deterioration thereof in addition to the considerable expenses involved in non-productive "make-ready" procedures.

The applicant has overcome the prior art difficulties by a novel method wherein the printing plates are mounted on a detachable backing sheet or plate wrapped around the cylinder. Appreciating the fact that these cylinders frequently operate at approximately 900 r.p.m., it would appear at first glance, that a very substantial locking means would be required to maintain the backing sheet in registered position on its associated cylinder. Surprisingly, however, the applicant has established that a longitudinal adhesive strip affixed to the cylinder will effect the desired result of maintaining a backing sheet in a desired registered position while presenting a minimum of inconvenience in detaching or temporarily releasing the backing strip for alignment and registration adjustments.

According to the present invention, during an initial "make-ready" process, index means are provided on both the cylinder and the backing sheet such that following completion of a first run when the backing sheet and the plates secured thereto are removed from the cylinder as a unit, the backing sheet assembly may be remounted in proper registration with a minimum of time and effort at a later date.

In addition to the foregoing, the backing sheet and plate assembly may be conveniently stored in flat condition, thus minimizing storage considerations.

In practice, this invention has made it possible for remounting times to be cut down by as much as 90% of the initial "make-ready" time.

It is an object of the present invention to provide a new and novel method of detachably mounting printing plates on printing cylinders or rolls to permit remounting thereof in specifically desired registry thereon.

It is a further object of the invention to provide a method of detachably mounting printing plates on printing cylinders such that subsequent remounting of the plates, in proper registry, may be effected with rapidity, ease and economy, while storage of the printing plate assemblies is reduced to something akin to the filing of correspondence files and the like.

A still further object of the invention resides in provision of an improved printing cylinder and plate assembly wherein the plate assembly may be stored separately, in flat condition, while the cylinder is employed in a different printing task in combination with a further plate assembly. Another object of the present invention is the provision of a method of detachably mounting printing plates on printing cylinders such that the life expectancy of the printing plates per se is considerably increased.

Further objects and advantages will become apparent as the description proceeds with reference to the appended drawings wherein:

FIGURE 1 is a perspective view of a cylinder and a backing plate exploded therefrom in flat condition;

FIGURE 2 is a perspective view of a cylinder with a

backing plate registered thereon immediately prior to wrapping of the plate around the cylinder;

FIGURE 3 is a perspective view of the cylinder and backing plate assembly in operative condition;

FIGURE 4 is a perspective, exploded view of a refined embodiment of the invention wherein a base sheet is applied to the cylinder before mounting of the backing sheet;

FIGURE 5 is a perspective view of a cylinder with base sheet applied and a strip of adhesive partially applied;

FIGURE 6 is a cross section taken along the lines 6—6 on FIGURE 5;

FIGURE 7 is a cross sectional view taken along the lines 7—7 of FIGURE 5;

FIGURE 8 is a perspective view of the assembly of FIGURE 4 in assembled condition.

Referring initially to FIGURES 1, 2 and 3 of the drawings, these figures disclose the general concept of the invention wherein a cylinder or roll, for use on a rotary press, is adapted to carry, in cooperation with the backing sheet, removable image transfer means properly positioned thereon for imprinting, and wherein provision is made in the initial "make-ready" procedure for indexing the backing sheet to facilitate repositioning thereof on the cylinder when re-runs are required.

With more particular reference to FIGS. 1, 2 and 3, a cylinder 1 includes a cylindrical backing sheet receiving surface 6, and raised shoulders 7, 7 extending around the periphery of the cylindrical surface 6 at each end thereof and substantially at right angles to the axis of the cylinder 1.

Since only one shoulder is actually used, as will hereinafter be more fully described, it is, in practice, only necessary to provide one shoulder at one end of the cylinder.

A first index means 10 is provided on an enlarged portion 11 of the cylinder 1 adjacent to a shoulder 7. Such index means generally takes the form of a fine scribe mark although other known indexing expedients could be used. It should also be noted that indexing means could also be formed on the cylindrical surface 6.

A strip of pressure sensitive adhesive 12 is carried on the cylinder and extends longitudinally of a cylindrical surface 6 for purpose to be later described. The adhesive used may be of any suitable type, preferably capable of revitalization to avoid the necessity of frequent replacement.

The backing sheet 14 comprises a transparent, rectangular sheet of plastic material, such plastic material must be flexible, to permit wrapping of the sheet around the cylinder, but non-deformable under the application of normal printing stresses and inert to attack by printing inks and solvents. Polyethylene terephthalate resin sheet has been found to be suitable for this purpose. Conveniently, the backing sheet is substantially rectangular and of a thickness slightly less than the height of the shoulder.

In its assembled position on the cylinder 1, a side edge 15 of backing sheet 14 abuts a shoulder 7 of the cylinder 1. Due to the fact that the shoulder 7 is slightly higher than the upper surface of the backing sheet, there is less likelihood of the sheet slipping over the shoulder and thus rendering the mounting operation more difficult. It should be noted that the particular shoulder 7 used in the initial "make-ready" operation should be identified in order that the same shoulder is always used in remounting plate assemblies. The backing sheet 14 is of such length that when it is wrapped about the cylinder 1, the top and bottom ends 16 and 17 thereof, will be in substantially edge abutting relationship and secured in position on the strip of adhesive 12.

To mount the image transfer means in proper remountable position on the cylinder 1, the backing sheet 14 is first wrapped about the cylindrical surface 6 with its side edge 15 abutting the first shoulder 7 on the cylinder 1 and with its ends 16 and 17 in substantially edge abutting relationship overlapping the adhesive strip 12 and

adhered thereto. The backing sheet is, of course, mounted as snugly as possible around the cylinder. Index means 20 are then marked on the backing sheet in register with the first-mentioned index mark 10 on the cylinder. The image transfer means 4 comprising rubber or similar printing plates are detachably adhered to the backing sheet 14. Conventional proving procedures are then carried out, as is well known, until the plates are all in desired position on the backing strip and hence on the cylinder. At this stage, the peripheral edges of the plates are sealed with a suitable solvent based neoprene cement or adhesive of the contact type such as that known in the trade as "Anchor-Weld" to prevent access of printing ink and solvents to the adhesive by which the plates are mounted on the backing sheet. Since the backing sheet was mounted in a particular registration with the cylinder 1, the backing sheet 14 may now be removed from the cylinder 1 with the plates properly aligned and sealed thereon, and may be replaced on the cylinder, in proper register thereon, by urging the side edge 15 against the indexed shoulder 7 on the cylinder 1 and wrapping the backing sheet 14 tightly about the cylindrical surface 6 with the first index means 10 on the cylinder 1 and the second index means 20 on the backing sheet 14 in registration. From this point, proving is very readily effected since all plates are in proper alignment with one another. This feature is most important where a series of cylinder assemblies are used simultaneously to effect multi-colour printing operations.

Prior to printing, the longitudinal abutting ends 16 and 17 of the backing sheet 14 and the side edges thereof are sealed, as were the plates, to prevent ink and solvent from penetrating to the underside of the backing sheet.

Turning to the embodiment illustrated in FIGS. 4 to 8 inclusive, it will be seen that this further embodiment, while obviously directed to the same invention, introduces precautionary measures particularly necessary where a large number of plates are to be mounted in closely spaced adjacency around the periphery of the printing cylinder.

In view of the previous remarks relating to the extreme accuracy required in mounting the plates, it will be appreciated that if, from necessity, at least one plate must be mounted in overlapping relation to the strip of adhesive 12, the slight increase in height at this point will create a problem in alignment. In order to overcome this problem, the applicant, as shown in FIGS. 4 to 8 inclusive, provides a base sheet 30 which surrounds the major portion of the cylinder leaving a minor portion wherein a strip of adhesive tape (adhesive on both sides thereof) is located. In this manner, since the adhesive strip 12 and base sheet 30 are of equal thickness, the backing sheet 14 is provided with a continuous, even, mounting surface.

With particular reference to FIGURE 5, it will be seen that opposed ends 32 and 33 of base sheet 30 terminate in spaced relation to provide a longitudinally extending space for insertion of the adhesive strip 12. Following mounting of the base sheet and adhesive strip first index means 10a are inscribed on the base sheet 30 preferably extending from a particular shoulder 7.

One method of attaching the base sheet 30 to the cylinder is by first applying to the cylinder a sheet of double-faced adhesive material around same such that an adhesive base-sheet receiving surface is formed. However, any known and suitable adhesive could readily be employed for adherence of the base sheet to the cylinder.

After the first index means 10a have been inscribed, the backing sheet 14 is mounted as hereinbefore described and the procedure followed is the same as that set forth with reference to FIGS. 1 to 3. In this second embodiment, the base sheet 30 and adhesive strip 12 always remain with the cylinder and other printing plate assemblies for different printing tasks can be set-up for repeated registration with the same modified cylinder.

From the foregoing it will be obvious to those skilled in this field that many modifications and changes may be

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effected without departing from the spirit and scope of the present invention and the applicant wishes to be limited only by the scope of the claims appended hereto.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. The method of detachably mounting image-transfer plates on a printing machine cylinder comprising the steps of tightly wrapping a base sheet around a major portion of the cylinder and inserting a strip of adhesive on the remaining minor portion to form a substantially even surface around said cylinder; tightly wrapping a flexible but otherwise substantially undeformable backing sheet around said base sheet, releasably adhering the terminal ends of said flexible backing sheet on said strip of adhesive; mounting the plates in selective spaced relation on the backing sheet; proving the resulting assembly for proper alignment of the plates and then indexing the back sheet in registration with index means carried on the cylinder such that the backing sheet and plates thereon can be removed from and then remounted on the cylinder in desired registration therewith.

2. The method of claim 1 wherein the cylinder is provided with at least one end shoulder, said shoulder acting as a guide during mounting of the backing sheet.

3. In a printing cylinder and backing sheet assembly; a cylinder having a backing sheet receiving surface, a raised shoulder at at least one end thereof; a strip of adhesive extending longitudinally of the backing sheet receiving surface, and first index means on the cylinder; a non-deformably flexible backing sheet carrying selectively aligned printing plates thereon and mounted on the said receiving surface with a side edge of said backing sheet abutting the first raised shoulder of the cylinder; second index means on said backing sheet for registration with said first index means, said backing sheet being

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tightly wrapped about said receiving surface with longitudinal opposite ends thereof in substantially edge-abutting relationship overlapping the aforementioned adhesive strip, said strip being interposed between the cylinder and the underside of the backing sheet to releasably adhere said backing sheet to the cylinder such that the backing sheet assembly can be repeatedly removed and remounted on the cylinder in proper registration; said assembly being further provided with a flexible, non-deformable base sheet adhered about the receiving surface and interposed between said receiving surface and said backing sheet with longitudinal edges thereof substantially spaced apart and with the said strip of adhesive on the receiving surface therebetween, said receiving surface being substantially evenly built up by the thickness of the base sheet and the adhesive strip.

4. A printing cylinder and backing sheet assembly according to claim 3 wherein the strip of adhesive comprises a strip of tape having adhesive on both sides thereof with one such side removably adhered to the receiving surface and the other side exposed for adherence to the aforementioned overlapping longitudinal ends of the backing sheet whereby the said adhesive strip may be replaced upon deterioration thereof.

References Cited

UNITED STATES PATENTS

2,145,072	1/1939	Cooley	-----	101-415.1	X
2,375,603	5/1945	Willard	-----	101-415.1	
3,108,538	10/1963	Barnes	-----	101-415.1	
3,119,330	1/1964	Kunetka	-----	101-426	
3,128,700	4/1964	Kunetka	-----	101-401.1	X

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