March 17, 1964 C. H. SKINNER ETAL 3,125,023

BLANKET TENSIONING MEANS FOR THE IMPRESSION CYLINDERS OF ROTARY PRINTING PRESSES

Filed March 7, 1961 2 Sheets-Sheet 1

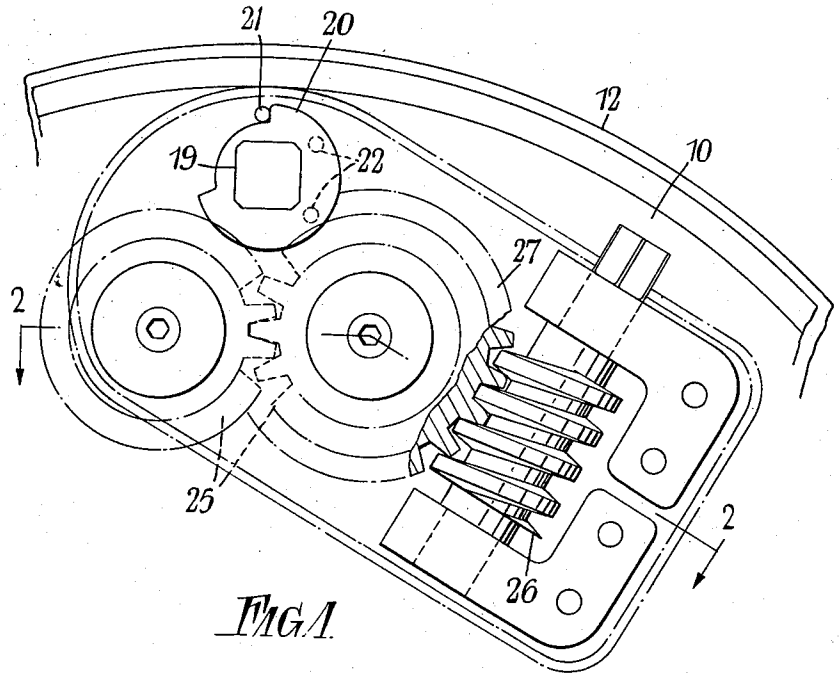


FIG. 1

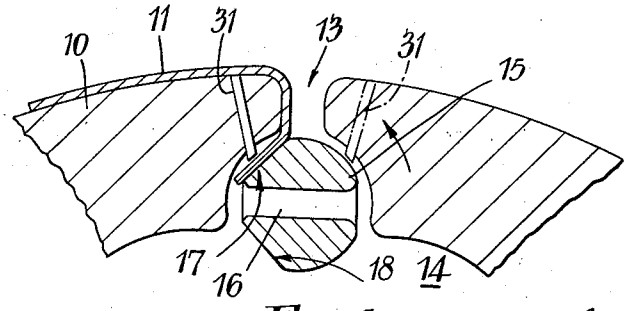


FIG. 4

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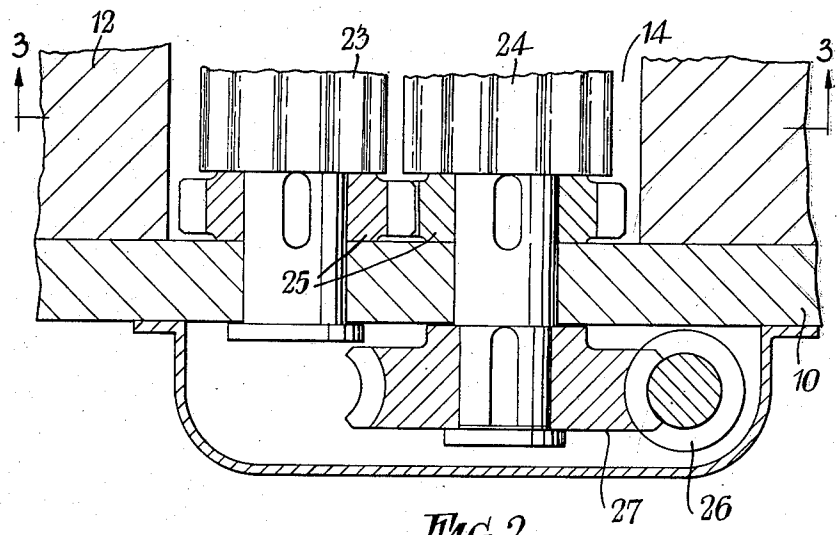


FIG. 2.

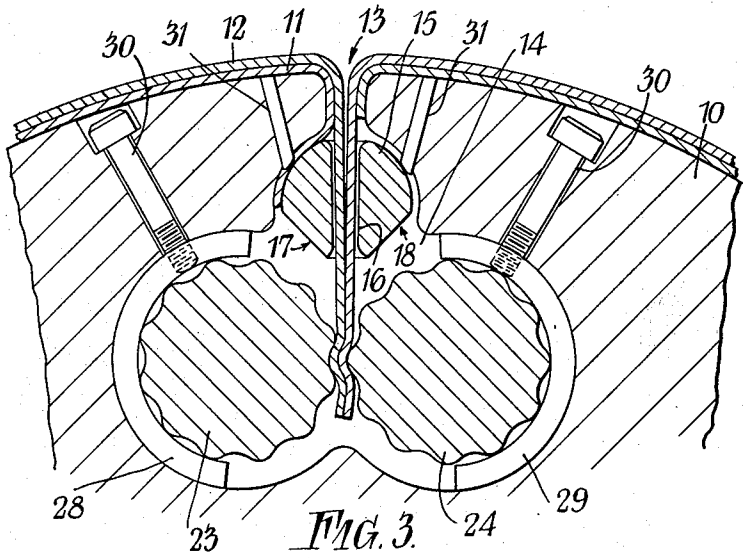


FIG. 3.

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BLANKET TENSIONING MEANS FOR THE IMPRESSION CYLINDERS OF ROTARY PRINTING PRESSES

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6 Claims. (Cl. 101—415.1)

This invention is concerned with printing presses incorporating rotary impression cylinders and relates more particularly to means for tensioning and securing the blankets which are normally applied to such impression cylinders.

It is the chief object of the invention to provide means whereby one or more blankets may be secured about a cylinder and maintained in substantially uniform tension without the necessity for extensive pre-preparation of such blankets and without the use of tension bars, additional tails, eyelets and other devices such as have hitherto generally been employed. As regards pre-preparation of the blankets it is envisaged that that will merely entail ensuring that the blankets are cut as squarely as is commercially possible.

According to the invention an impression cylinder having at least one longitudinally extending blanket slot therein is provided internally with a pair of cooperating tensioning rollers or the like which are rotatable about axes extending lengthwise of the cylinder and are so disposed in relation to the blanket slot that, on introduction of the leading and trailing ends of a blanket through the latter, they (the rollers or the like) will, on appropriate rotation, be operable to grip such ends and to tension the blanket about the cylinder. If desired the rollers may be formed with longitudinally extending corrugations, teeth or the like to increase the gripping effect and means may be incorporated to prevent any undesirable flexing of said rollers upon tensioning of the blanket. In those cases where the cylinder is to be blanketed by two blankets disposed one over the other it is proposed in addition to the tensioning rollers or the like also to provide internally of the cylinder an angularly movable clamping bar or the like which extends longitudinally of the cylinder and is operative to grip the leading end of an under blanket such bar or the like incorporating a slot which when the bar is in its operative or clamping position will be aligned with the blanket slot and serve to guide the ends of the top blanket to the aforesaid tensioning rollers or the like.

In order that the said invention may be clearly understood and readily carried into effect the same will be hereinafter more fully described with reference to the accompanying drawings which show one embodiment by way of example and in which:

FIGURE 1 is an end elevational view of a part of an impression cylinder,

FIGURE 2 is a section on the line 2—2 of FIGURE 1,

FIGURE 3 is a section on the line 3—3 of FIGURE 2,

FIGURE 4 is a detail view similar to that of FIGURE 3 but illustrating an operational stage.

Referring now to the drawings, **10** denotes an impression cylinder which in the embodiment illustrated has two blankets, i.e. an under and a top blanket **11**, **12** applied thereto. As will be seen the cylinder is formed with a longitudinally extending blanket slot **13** which is, it will be noted, of greatly reduced width as compared with the slots usually provided in such cylinders hitherto. Additionally the cylinder **10** is formed internally with a

longitudinally extending recess or chamber **14** with which the aforesaid slot communicates. Disposed within the recess or chamber **14** and with its longitudinal axis centrally of the blanket slot is a clamping bar **15** which extends lengthwise of the cylinder and is supported for angular or rotary movement about its longitudinal axis. The bar **15** which is generally of circular section is formed with a diametrical slot **16**, such slot, which extends completely through the bar and is of a length such that it will accommodate the width of the blanket being hereinafter referred to as a guide slot. At each side of the guide slot **16** the bar is chamfered or cut away thereby to provide two faces **17**, **18** which extend lengthwise of said bar and are inclined in the region of 90° to each other or in the region of 45° to the axis of the aforesaid guide slot. The angles of the two faces **17**, **18** indicated are purely exemplary and in practice they may be varied, the object being that when the bar is in its inoperative position as shown in FIGURE 4 prior to the application of a blanket there shall be a sufficient space between one or other of said faces and the wall of the recess or chamber to allow of free introduction of the leading edge of a blanket to one or other side of said bar depending upon the intended direction of rotation of the cylinder.

In the embodiment illustrated it is assumed that the cylinder **10** is capable of rotation in either of two directions at will but if it were intended for unidirectional rotation then the clamping bar **15** might well be provided with only one chamfered face **17** or **18**. A single chamfered face would also be possible with a reversible cylinder but in such cases the provision of two is considered to be preferable. As will be seen that part of the recess or chamber housing the clamping bar **15** will be of substantially circular section and of a diameter larger than that of the bar by an amount slightly less than the normal thickness of a blanket. To permit of angular movement of the clamping bar it is provided at one end projecting from the end of the cylinder **10** with a squared portion **19** to which an operating lever (not shown) may readily be attached.

The arrangement is such that the clamping bar **15** will be movable angularly through 90° or substantially 90° by means of the aforesaid operating lever, from a first or feed position as shown in FIGURE 4 to a second or clamping position as shown in FIGURE 3 and vice versa. In the first position one of the aforesaid recessed or chamfered faces **17**, **18** on the bar will be directed towards the blanket slot **13** thereby to provide an inclined passage which will freely accommodate the leading end of the under blanket. In this position as will be seen from FIGURE 4 the axis of the guide slot **16** will be directed transversely at right angles or substantially at right angles to the blanket slot **13** but in the second position of said clamping bar said guide slot will be brought into alignment with and effectively form an extension of the blanket slot as shown in FIGURE 3. In order to facilitate setting of the clamping bar **15** in either of its limiting positions it may as indicated in FIGURE 1 be provided externally of the cylinder with a plate **20** having an arcuate slot or cut away portion with which a stop pin **21** is adapted to cooperate. Conveniently spring detent means such as indicated at **22** may be provided for the purpose of holding the bar in either position in which it may be set.

Also disposed within the aforesaid recess or chamber **14** within the cylinder **10** is a pair of tensioning rollers, **23**, **24** which also extend lengthwise of the cylinder and are rotatable about their longitudinal axes, said rollers each being formed as will be clearly seen from FIGURE 3 with a plurality of suitably profiled teeth, corrugations or the like and being relatively so arranged that on introduc-

tion of the ends of a blanket therebetween the rollers will on rotation be effective firmly to grip such ends and to draw or tension the blanket about the cylinder as will be hereinafter described. The arrangement is such that the point of entry to or nip between the rollers will be aligned with the aforesaid guide slot 16 in the clamping bar 15 when the latter is in its second or operative position.

In the embodiment illustrated the tension rollers 23, 24 are geared together as indicated at 25 and are adapted to be rotated through the medium of a worm wheel 26, 27 the shaft of said worm wheel having a squared end to which an operating tommy bar or the like may be applied. In order to prevent undesirable flexing of the rollers 23, 24 on tensioning of the blanket, it may be desirable as indicated in FIGURE 3 to provide either at the centre or at spaced points therealong arcuate bearing shoes or the like members 28, 29 of brass or other suitable material such members being maintained in position by means of locking or set screws 30. Although it is intended that the high points of the rollers 23, 24 will contact the inner surfaces of the shoe like members 28, 29 there will in fact be little wear. The provision of supports at one or more points along the length of the rollers 23, 24 will prevent any tendency to flexing and will ensure the application and maintenance of even tension over the full width of the blanket. The preventing of undesirable flexing may well be effected in other ways, that described and illustrated being purely by way of example.

When applying blankets to a cylinder equipped in the manner indicated above the clamping bar 15 will be located in its first position as indicated in FIGURE 4 so that the leading end of the under blanket 11 may be introduced through the blanket slot 13 and, depending upon the intended direction of rotation of the cylinder, guided into the appropriate passage between the recess or chamfered face 17 or 18 of the clamping bar and the wall of the recess or chamber 14 housing the latter. With the leading end of the blanket 11 inserted as far as it will readily go, the clamping bar 15 is then rotated through approximately 90° into the position shown in FIGURE 3. This rotation of the bar will result in nipping or squeezing of the leading end of the blanket 11 between the said bar and the wall of the recess and in advancement of said leading end around the bar to a limited extent. The leading end of the blanket 11 will thus be effectively gripped and moreover the guide slot 16 in said bar 15 will be brought into alignment with the blanket slot 13. With the leading end of the blanket 11 thus secured said blanket may be wrapped around the cylinder and the trailing end introduced into the blanket slot 13.

With the under blanket 11 in position the leading end of the top blanket 12 is passed through the blanket slot 13 and thence through the guide slot 16 in the clamping bar 15 into a position wherein it will be gripped by the tension rollers 23, 24 on appropriate rotation of the latter. With the leading end of the top blanket 12 so anchored the blanket may then be wrapped around the cylinder and its trailing end introduced via the blanket slot 13 and said guide slot 16 to the tensioning rollers 23, 24. On further rotation of the rollers 23, 24 the top blanket 12 will be tensioned evenly about the cylinder and the tensioning of such blanket will serve to maintain the trailing end of the under blanket 11 in place. If desired instead of the procedure outlined above the top blanket 12 may be wrapped around the cylinder and both the leading and trailing ends may be fed simultaneously through the blanket slot 13 and the guide slot 16 to the tensioning rollers 23, 24. It may be mentioned here that the drive or operating mechanism for the tensioning rollers will preferably incorporate self locking means of known type such that when the blanket is appropriately tensioned said rollers will be automatically locked against any movement which would allow slackening or easing of the set tension. The locking means will of course be such that in the event that it is required to change the blanket said means will be readily releasable by an operator.

As a precaution against slipping the cylinder may be provided at spaced points along its length with pins such as are indicated at 31 (FIGURES 3 and 4) which will project into the recess or chamber and will be effective to engage the leading end portion of the under blanket. If the cylinder is only capable of unidirectional rotation the pins 31 need only be provided at one side of the blanket slot. Possibly the construction may be such that the rollers such as 23 and 24 will be spring loaded or otherwise so mounted that when operated to tension the blanket they will be urged inwardly towards each other thereby to increase the grip in the blanket ends.

In the foregoing the use of two blankets has been envisaged but there are instances when only one blanket is required. In those cases where a single blanket is to be used the clamping bar 15 referred to above will be omitted and the cylinder which will be equipped with internal tensioning rollers, such as 23, 24 indicated above, will be so formed that blanket ends introduced through the blanket slot will be guided to said tensioning rollers.

It may be mentioned here that depending upon the type of blanketing to be employed impression cylinders may be fitted with one or more sets of clamping bars and/or tensioning rollers such sets where more than one is present being angularly displaced around the cylinder.

The mechanism hereinbefore described provides a simple and effective means for attaching blankets to impression cylinders and allows for quick and easy removal and replacement of blankets when required. Moreover such mechanism will provide for a uniform tension across the width of the blanket and for the maintenance of such tension throughout the life of the blanket. Blankets for application to cylinders so equipped will require the minimum of pre-preparation it only being necessary to ensure that they are cut as squarely as is commercially possible and finally the width of the blanket slots in the cylinders will be reduced to an absolute minimum thereby providing for increases in the usable printing lengths of the cylinders.

We claim:

1. In a rotatable impression cylinder for a printing press having a blanket slot extending longitudinally thereof and including a top blanket-gripping and tensioning means located in the cylinder inwardly of said slot and extending lengthwise of the cylinder, said means being provided with a blanket inlet aligned with the blanket slot, and means for operating the blanket-gripping and tensioning means to grip the leading and trailing ends of a top blanket introduced through the blanket slot into the blanket inlet and for tensioning the top blanket on the cylinder, the improvement including a clamping bar for gripping the leading end of an underblanket, said clamping bar being located between the blanket slot and the top blanket-gripping and tensioning means and extending lengthwise of the cylinder, said bar being movable angularly about its longitudinal axis into and out of an operative position in which it is effective in conjunction with an internal longitudinal surface in the cylinder for gripping the leading end of an underblanket.

2. A rotatable impression cylinder as claimed in claim 1, in which the clamping bar is provided with a guide slot extending lengthwise thereof and which when said bar is in its operative gripping position is in alignment with the blanket slot in the cylinder and serves to guide the ends of the top blanket to the inlet of the top blanket-gripping and tensioning means.

3. A rotatable impression cylinder as claimed in claim 1, in which the clamping bar is of generally circular section and is disposed within an internal longitudinal recess in the cylinder of a diameter larger than that of said bar by an amount slightly less than the normal thickness of the underblanket to be gripped by the bar, said

clamping bar having a chamfered surface extending lengthwise thereof in a position along the bar such that when the bar is in its inoperative position said chamfered surface facilitates the introduction of the leading end of an underblanket therealong between the chamfered surface and the surface of said internal recess in the cylinder.

4. A rotatable impression cylinder as claimed in claim 3, in which the clamping bar is provided with a guide slot extending lengthwise thereof and which when said bar is in its operative gripping position is in alignment with the blanket slot in the cylinder and serves to guide the ends of the top blanket to the inlet of the top blanket-gripping and tensioning means.

5. A rotatable impression cylinder as claimed in claim 3, including spaced pins located along the length of the

cylinder and projecting through the surface of the internal recess for engaging the leading end of an underblanket when gripped by the clamping bar.

6. A rotatable impression cylinder as claimed in claim 1, including means on one end of the cylinder for rotating the clamping bar and means associated therewith for limiting the rotation of the clamping bar between its operative and inoperative positions.

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