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A. BRAUNWORTH

2,409,536

PRINTING CYLINDER BLANKET SECURING MECHANISM

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2 Sheets-Sheet 1

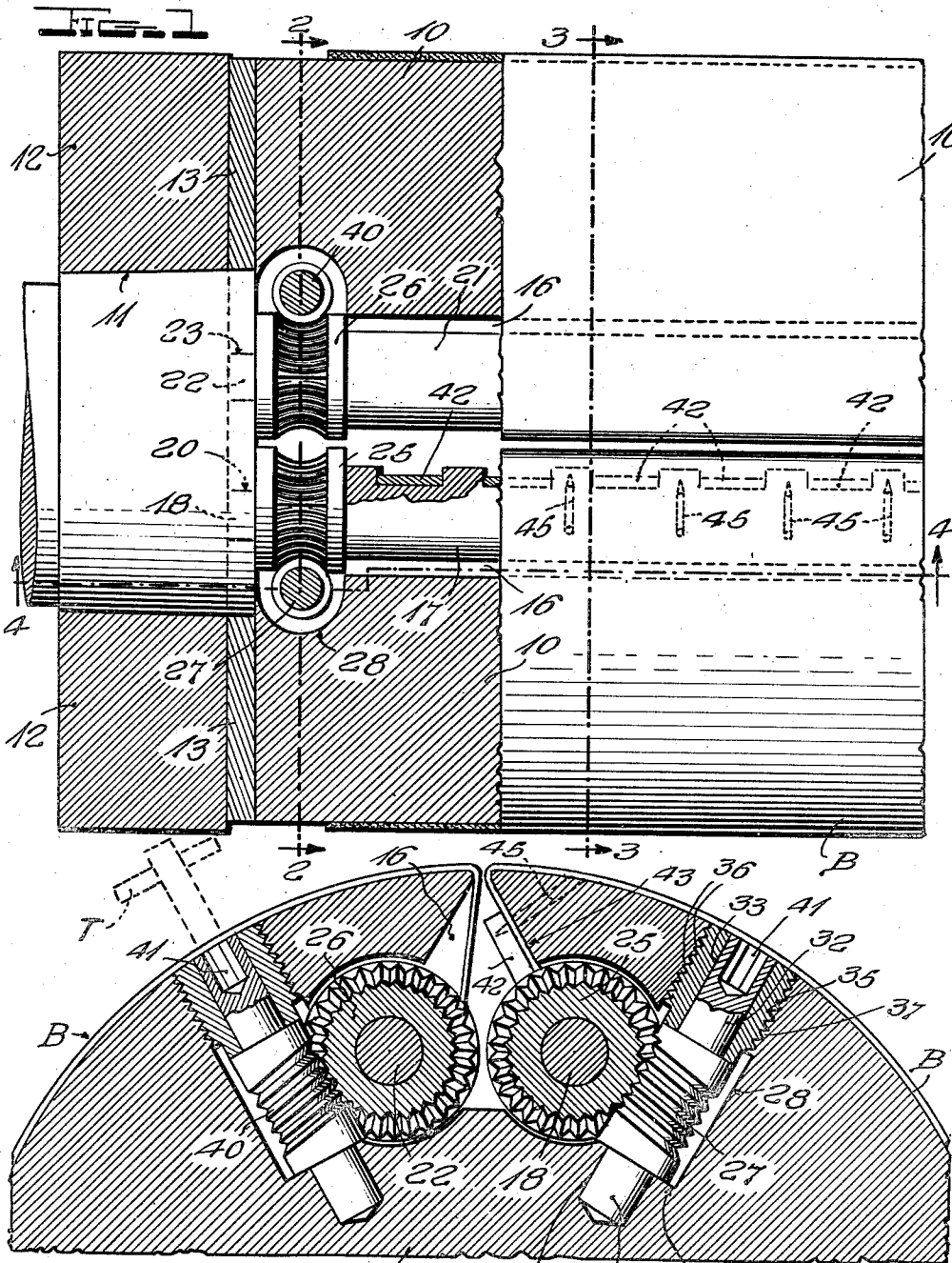


FIG. 2

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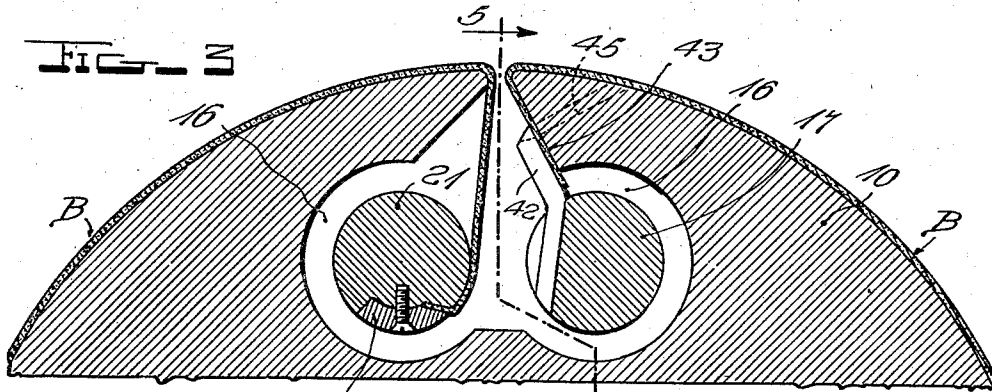
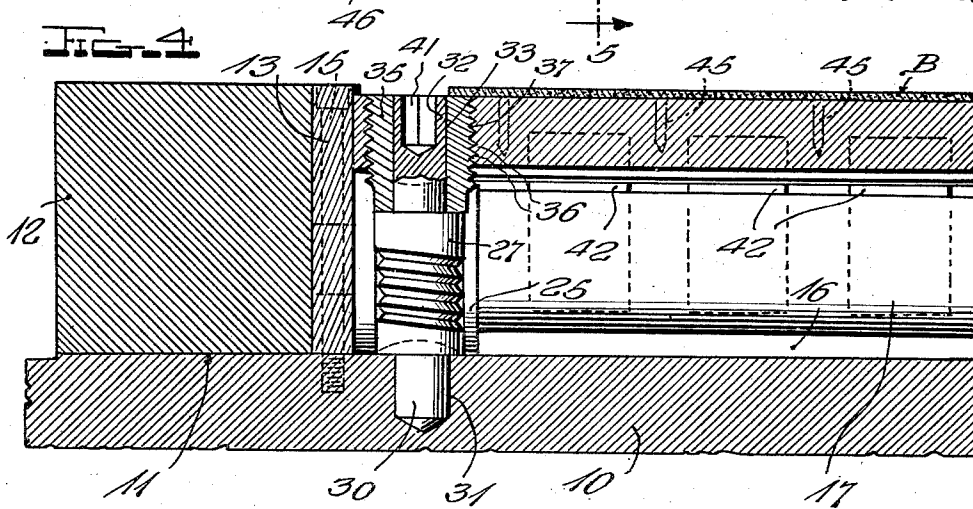
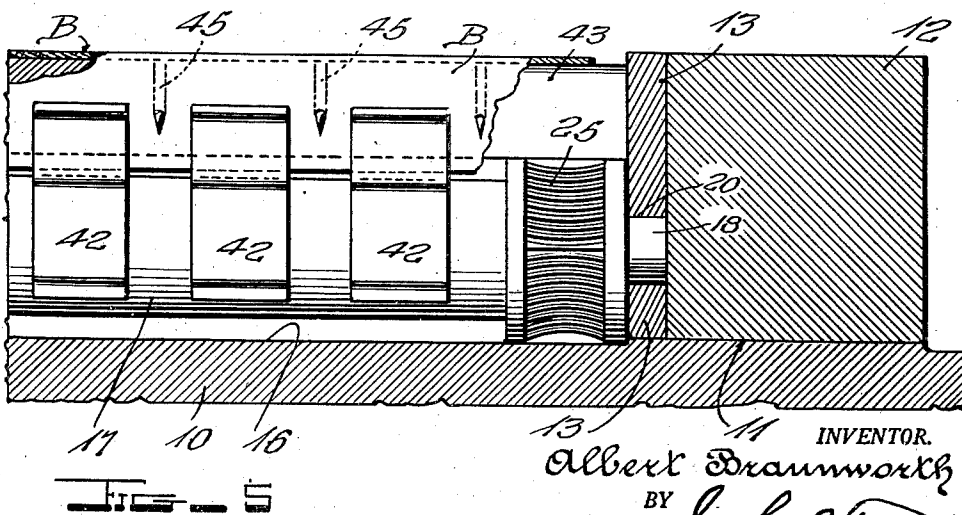
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PRINTING CYLINDER BLANKET SECURING MECHANISM

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2 Claims. (Cl. 101—415.1)

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This invention relates to printing machinery, and more particularly to improved mechanism for securing an impression blanket to an impression cylinder of a printing couple of a rotary printing machine.

In printing practice, a printing couple includes a plate cylinder and a cooperating impression cylinder, each cylinder of the couple being provided with conventional bearer rings at its terminals, and these bearers or rings operating in rolling contact in order to maintain the printing components of the plate and impression cylinders in accurate printing relationship.

The plate cylinder has a plurality of conventional relatively rigid printing plates secured to its peripheral surfaces and the printing faces of these plates cooperate with an impression blanket which is secured to the peripheral surface of the co-acting impression cylinder. It has been the practice to secure the plates to the cylinder by slidable plate clips which are actuated by rotatable clip rods that extend through apertures formed in the bearers, and the clip rods, in turn, are operated by a suitable tool or wrench that engages their outer terminals. The blanket for the impression cylinder is usually secured to the peripheral surface of the cylinder by clamping one longitudinal edge of the blanket to the cylinder and then drawing the blanket taut upon the cylinder surface by a rotatable reel rod to which the blanket is attached. The reel rod usually extends axially through an aperture formed in the bearer, and this rod is rotated by a wrench or suitable tool that engages this outer terminal.

This arrangement has proven unsatisfactory in commercial use because the heavy impression pressure imposed on the cooperating rolling bearers sometimes causes them to crack or rupture at locations adjacent the apertures through which the reel rods extend.

It is, therefore, an object of this invention to provide an improved blanket "lock-up" or securing mechanism which is operable from a location inside the bearers of the impression cylinder, and in which the blanket-securing components are operably supported independently of the bearers.

It is also an object of this invention to provide an improved blanket securing mechanism which includes a plurality of blanket clamps that are supported by a rotatable rod or shaft, and a blanket tightening shaft or reel rod, both rods being rotated by an improved actuating mechanism which is operated from a location inside the bearers of the impression cylinder, and in this

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device all of its components are operably supported independently of the bearers.

A more specific object of this invention is to provide an improved blanket securing mechanism for securing a blanket on an impression cylinder having bearers at each end thereof, which mechanism includes a rotatable rod that supports a plurality of blanket clamps, a reel rod for drawing the blanket taut upon the cylinder, radially-extending worms meshing with worm gears carried by the said rods, and which worms are operable by a radially-disposed tool or wrench from a location inside the bearers, the components of the device being so arranged that they are operably supported independently of the bearers.

It is also an object of this invention to provide a blanket-securing mechanism of generally improved construction whereby the device will be simple, durable and inexpensive in construction, as well as convenient, practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in details of construction hereinafter described and claimed, it being understood that various changes in form, proportion, and minor details of construction may be made within the scope of the claims without departing from the spirit or sacrificing any advantages of the invention.

For a complete disclosure of the invention, a detailed description of it will now be given in connection with the accompanying drawings forming a part of the specification, wherein:

Figure 1 is a fragmental plan view of an impression cylinder having the invention applied thereto, parts appearing in section;

Figure 2 is a fragmental transverse section taken on the line 2—2 of Figure 1;

Figure 3 is a similar view taken on the line 3—3 of Figure 1;

Figure 4 is a fragmental longitudinal section taken on the line 4—4 of Figure 1; and

Figure 5 is a similar view taken on the line 5—5 of Figure 3 and looking in the direction indicated by the arrows.

Referring to the drawings, in which similar reference characters designate corresponding parts, there is depicted a conventional impression cylinder 10 of a printing couple and which is arranged to support the conventional impression blanket B, as will be more fully explained hereinafter.

An annular recess 11 is formed at each end of the impression cylinder and receives therein an annular bearer 12 of conventional construction. Although only one end of the impression cylinder has been depicted in the drawings, it is to be understood that both ends of the cylinder are similarly constructed and arranged except that provision may be made at one end only to accommodate the rod actuating means which will be disclosed hereinafter. Arcuate plates 13 are received within the recess 11 and they are secured to the cylinder by radially-disposed screws 15. Each plate 13 abuts the inner axial terminal of the bearer 12 and forms a support for components to be hereinafter disclosed.

A longitudinally-extending recess 16 is formed in the impression cylinder 10 adjacent its periphery for the reception of a longitudinally-extending clamping shaft or rod 17 which has its opposed terminals reduced to provide bearings or gudgeons 18 that are rotatably received in bearing apertures 20 formed in the plates 13. A blanket tightening shaft or reel rod 21 is positioned in the recess 16, and it is arranged parallel with the clamping shaft 17. The opposed terminals of the reel rod 21 are reduced to provide bearings or gudgeons 22 that are rotatably received in bearing apertures 23 formed in the plates 13.

A worm wheel or gear 25 is suitably secured to one terminal of the clamping rod 17, and a similar worm wheel or gear 26 is similarly secured to a terminal of the reel rod 21. The worm gear 25 meshes with a worm 27 that is received in radially-extending recess 28 formed in the cylinder 10. This worm has a reduced stub shaft 30 formed at its inner terminal which is received in a bearing aperture 31 formed in the cylinder 10. A stub shaft 32 is formed at the outer terminal of the worm and it is rotatably received in a cylindrical bearing aperture 33 formed in a bearing sleeve or keeper 35. The sleeve 35 is provided with peripheral threads 36, which are received within a threaded aperture 37 formed in the cylinder 10. By this arrangement, the worm 27 is rotatably supported, and it is held against longitudinal movement by the inner terminal of the bearing sleeve 35 which engages the outer terminal of the worm body, and the inner end wall 38 of the recess 28 which engages the inner terminal of the worm body 27. A similar worm 40 meshes with the worm wheel 26 which is carried by the reel rod 21, and this worm is operably supported in the same manner as the worm 27. A polygonal axially-disposed wrench-engaging socket or recess 41 is formed in the outer terminal of each worm stub shaft 32 for the reception of a suitable tool or wrench T, indicated in dotted lines in Figure 2.

The clamping rod 17 has a plurality of clamping plates 42 suitably secured thereto, and the outer portion of each clamping plate is substantially radially-disposed relative to the clamping rod to cooperate with a similarly disposed clamping surface 43 which forms a wall of the cylinder recess 16. Blanket retaining pins 45 project outwardly from the clamping wall 43, and these pins extend through the clamping terminal of the blanket B in order to locate and temporarily secure the blanket relative to the cylinder 10, as will be more fully explained hereinafter. The opposed terminal of the blanket is secured to the reel rod 21 by a suitable clamp 46 (Figure 3), so that upon rotation of the reel rods the blanket

may be drawn taut around the cylinder blanket-supporting surface.

In securing the blanket B to the impression cylinder 10, the clamping terminal of the blanket is temporarily secured to the pins 45, and the wrench or tool T is inserted in the socket 41 of the worm 27, and then the tool T is turned to rotate this worm 27. Upon rotation of the worm 27, the worm gear 25 and clamping rod 17 are rotated, thereby moving the clamping plates 42 into engagement with the clamping terminal of the blanket B, to thus securely clamp the blanket between the clamping plates 42 and the clamping surface 43 of the cylinder 10. Now the wrench or tool T is inserted in the socket 41 of the worm 40, and, upon rotation of this worm, the worm gear 26 and the reel rod 21 are rotated, thereby drawing the blanket taut around the cylinder blanket supporting surface.

From the foregoing, it is manifest that this arrangement provides a quick-acting, efficient and relatively simple construction in which the components of the blanket clamping and tightening mechanism may be conveniently operated by a radially-disposed tool at a location inside the cylinder bearers, and that the operating components of the blanket clamp and tightening mechanism are operably supported independently of the cylinder bearers, thus enabling the bearers to present maximum strength to resist impression pressure.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, and it will be further understood that each and every novel feature and combination present in or possessed by the mechanism herein disclosed forms a part of the invention included in this application.

What is claimed as new and useful is:

1. In an impression cylinder adapted to receive a flexible blanket therearound and having an annular bearer recessed in the cylinder at each end thereof, an arcuate plate recessed in the cylinder against the inner side of each bearer, an axially-extending clamping surface in the cylinder, a shaft disposed in axial relation to the cylinder and rotatably supported in bearing apertures formed in the arcuate plates, a worm gear rotatable with the shaft, clamping members carried by the shaft to engage a terminal of the blanket and clamp it against the clamping surface, a worm-receiving recess formed in the cylinder, a radial inner bearing aperture formed in the cylinder in communication with the worm-receiving recess, an annular thrust shoulder formed in the cylinder at the inner radial terminal of the worm-receiving recess, a radially-disposed threaded aperture formed in the cylinder in axial alignment with the inner bearing aperture and located between the worm-receiving recess and the cylinder surface, a bearing sleeve threadedly secured in the threaded aperture and having an outer bearing aperture formed therein in axial alignment with the inner bearing aperture, an annular thrust surface formed at the inner terminal of the bearing sleeve, a worm located in the worm-receiving recess in mesh with the worm gear and having its inner and outer terminals engaging the thrust shoulder and thrust surface respectively, an inner stub shaft extending axially from the inner terminal of the worm and rotatably received in the inner bearing aperture,

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an outer stub shaft extending axially from the outer terminal of the worm into the outer bearing aperture and having a tool-receiving socket formed therein at the cylinder surface for operable engagement by a radially-disposed tool whereby the worm, worm gear and clamping shaft are rotated by rotation of the tool to thereby move the clamping members into clamping engagement with the blanket, and means for tensioning the clamped blanket around the cylinder.

2. In an impression cylinder adapted to receive a flexible blanket therearound and having an annular bearer recessed in the cylinder at each end thereof, an arcuate plate recessed in the cylinder against the inner side of each bearer, means for clamping one terminal of the blanket to the cylinder, a shaft disposed in axial relation to the cylinder and rotatably supported in bearing apertures formed in the arcuate plates, means for securing the opposed terminal of the blanket to the shaft, a worm gear rotatable with the shaft, a worm-receiving recess formed in the cylinder, a radial inner bearing aperture formed in the cylinder, in communication with the worm-receiving recess, an annular thrust shoulder formed in the cylinder at the inner radial terminal of

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the worm-receiving recess, a radially-disposed threaded aperture formed in the cylinder in axial alinement with the inner bearing aperture and located between the worm-receiving recess and the cylinder surface, a bearing sleeve threadedly secured in the threaded aperture and having an outer bearing aperture formed therein in axial alinement with the inner bearing aperture, an annular thrust surface formed at the inner terminal of the bearing sleeve, a worm located in the worm-receiving recess in mesh with the worm gear and having its inner and outer terminals engaging the thrust shoulder and the thrust surface respectively, an inner stub shaft extending axially from the inner terminal of the worm and rotatably received in the inner bearing aperture, an outer stub shaft extending axially from the outer terminal of the worm into the outer bearing aperture and having a tool-receiving socket formed therein at the cylinder surface for operable engagement by a radially-disposed tool whereby the worm, worm gear and shaft are rotated by rotation of the tool to thereby tension the blanket around the cylinder.

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