Nov. 7, 1961 J. A. HECKMAN 3,007,652

PAPER ROLL MOUNTING MECHANISM

Filed Dec. 3, 1959

FIG. 1

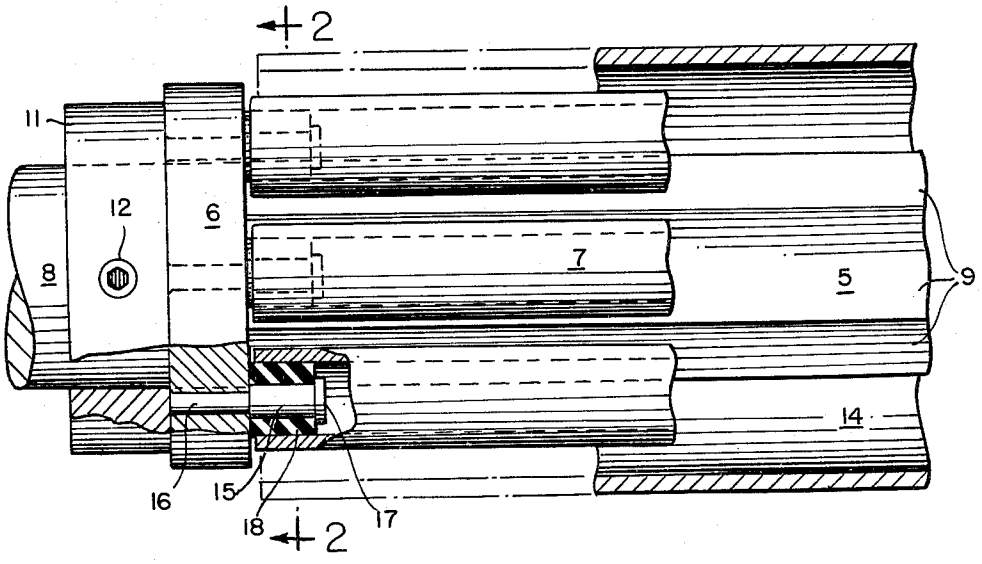


FIG. 2

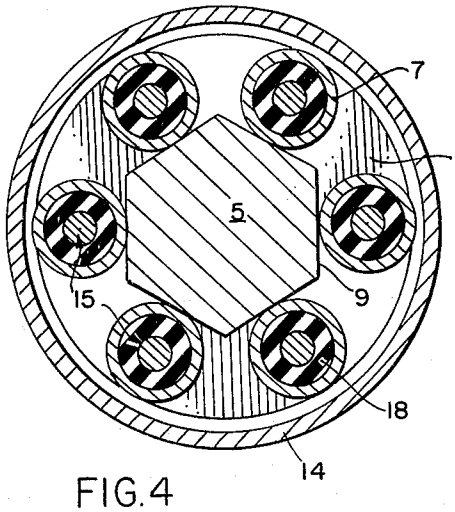


FIG. 3

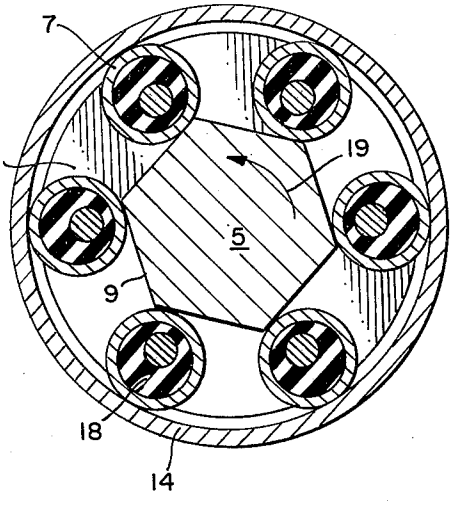
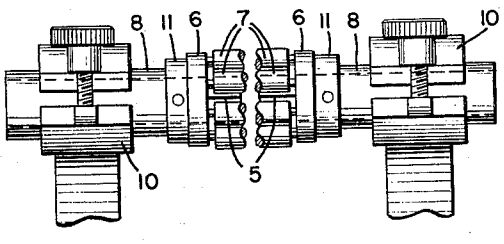


FIG. 4



INVENTOR:

JOHN A. HECKMAN

BY

Rummler and Snow

ATT'YS

United States Patent Office

3,007,652
Patented Nov. 7, 1961

3,007,652

PAPER ROLL MOUNTING MECHANISM

John A. Heckman, 8110 St. Louis Ave., Skokie, Ill.

Filed Dec. 3, 1959, Ser. No. 857,127
4 Claims. (Cl. 242—72)

This invention relates to improvements in a mounting mechanism for the cores of printing paper rolls and the like.

In the printing industry, where the printing is made on paper fed to the press from rolls of paper, expeditious replacement of a new roll of paper for an exhausted roll is imperative to keeping operational costs at a minimum.

Paper rolls, used with printing presses are supported on cores. These cored rolls are keyed, in some manner, to a shaft which is removably positionable on axially-spaced bearings adjacent one end of the printing press. Preparatory to starting the press on its run, the free end of the paper from a fresh roll is threaded into and through the paper-feed mechanism of the press. When the printing operation is started, and as it continues, the paper is drawn from the roll by the paper-feed mechanism during which time the paper unreels and the shaft, to which the roll is keyed, turns on its bearings.

When one paper roll is exhausted, a fresh roll has to be placed on the shaft. The facility with which this can be done has a material effect on the printing costs.

One of the more current practices, in keying the paper roll to its supporting shaft, is by driving frusto-conical-shaped wedges, slidable on the shaft, into the opposite ends of the paper-roll core. When an exhausted roll has to be replaced by a fresh roll, the wedges have to be driven out from the core of this roll and again driven into the core of another roll.

The main objects of this invention are to provide an improved form of internal clutch mounting for paper roll cores for effecting the expeditious substitution and alignment of a fresh roll of paper for an exhausted roll; to provide an improved paper-roll-core clutch mounting of this kind wherein the clutch elements are normally retracted from clutching position and may be shifted instantly out of and into clutching relationship with a paper roll core; to provide an improved clutch mounting of this kind wherein elastic cushions are interposed between the clutch elements and their mounting to effect a yielding engagement of the clutch elements with the core of the paper roll and, also, absorb vibration and noise caused by the paper roll rotation; and to provide an improved paper-roll-core clutch mounting of this kind which is of such simple construction as to make its manufacture very economical, its use most facile, light of weight and its usefulness extremely long-lived.

One specific embodiment of this invention is shown in the aocompanying drawing, in which

FIGURE 1 is an elevational view of one end of a paper-roll clutch mounting constructed in accordance with this invention, a portion of the view being broken away to show the internal structure and the paper-roll core being shown partly in section and partly in phantom;

FIG. 2 is a cross-sectional view of the same taken on the plane of the line 2—2 of FIG. 1, the supporting shaft and the tube mounting-members being shown in their normal relative positions for inserting the mounting into or removing it from a paper-roll-core; and

FIG. 3 is a view similar to FIG. 2 but showing the position of the series of tubes clutching the paper-roll core after a relative rotative movement of the shaft and the tube-supporting disks.

FIG. 4 is a front elevational view, greatly reduced in size with parts omitted.

The essential concept of this invention involves a shaft the intermediate portion of which is of polygonal form and rotatively mounting a pair of axially-spaced members on the opposed faces of which are fixed circular series of posts each embraced by an elastic ring, opposed pairs of which rings are compressed into the ends of tubes longitudinally-disposed between the members with the peripheries of the tubes in contactive opposition with the respective polygonal faces of the shaft so that a relative rotation of the shaft and the members causes a circumferential shifting of the tubes on the polygonal faces of the shaft and a consequent compression of the elastic rings as the tube peripheries clutch the internal face of the paper-roll core.

A paper-roll clutch mounting embodying the foregoing concept comprises a shaft 5 rotatively supporting a pair of members 6 spanned by and supporting a concentric series of clutch elements 7.

The shaft 5, as here shown, is preferably constructed of light weight material, such as aluminum, has most of its length, between the cylindrical ends 8, of hexagonal form presenting six equal-width flat faces 9 extending the entire distance between the end members 6. The over-all length of the shaft 5 is such that the opposite cylindrical ends 8 are positionable in conventional bearings 10 axially spaced apart at one end of a printing press (not shown) to position the paper-roll, supported on the shaft 5, so that the paper being reeled from the roll is aligned properly with the paper-feed mechanism of the printing press. As the members 6 are not fixed to the shaft 8, collars 11 are keyed to the shaft 5, adjacent each end member 6, by set screws 12.

The end members 6 here are shown in the form of disks of appropriate thickness. The disks 6, as shown in FIG. 1 of the drawing, are of a diameter smaller than the inside diameter of the paper roll core 14 to insure easy placement of the paper-roll core 14, on clutch mounting and removal therefrom, as will be explained presently.

The opposed faces of the axially-spaced and shaft-supported disks 6 have fixed thereon series of pins 15 arranged concentrically of the shaft 5 and spaced equidistantly. These pins 15 have reduced-diameter shanks 16 seated in apertures in the disks 6, the ends of the shanks being anchored in any suitable manner such as by peening over, etc., to secure the pins 15 against axial displacement. The opposite end of each pin is enlarged to form a head 17.

An elastic ring 18, formed of rubber or comparable resilient material, is mounted on each pin 15 between the head 17 and the opposed face of the supporting disk 6.

The clutch elements 7 here are shown as tubes. These are of a length to approximately span the distance between the opposed, pin-supporting faces of the disks 6. Such tubes may be formed of any suitable material of appropriate diameters and wall thickness to meet the requirements of strains to which the clutch mounting will be subjected with certain sizes of paper rolls. I have found that aluminum tubing is suitable. The inside diameter of these tubes 7 and the outside diameter of the rings 18 should be such that the rings 18 are slightly compressed when pressured into the ends of the respective tubes 7.

The circular positioning of the pins 15 on the disks 6 and the outside diameters of the tubes 7 should be such that the diameter of a circle, embracing the several tubes and barely touching their exterior peripheries when the tubes are in their normal middle positions on the respective faces 9 of the shaft 5, is enough less than the inside diameter of the paper-roll core 14 to permit the

paper-roll core **14** to be inserted easily on and removed from this clutch mounting.

This improved paper-roll clutch mounting is used and operates in the following manner:

With the clutch mounting in place on the printing machine the roll is lifted, or hoisted, and positioned on the mounting mechanism of the present invention.

A quick relative rotation of the paper roll and/or the shaft **5**, e.g. the turning of the shaft **5** in the direction of the arrow **19** shown in FIG. 3, will cause the tubes **7** to ride up on the respective shaft faces **9** and become wedged in between these flat faces and the interior face of the core **14**. As shown in FIG. 3, this movement compresses the respective rings **18** which tend to maintain the clutching of the core by the tubes **7** so long as there is tension on the paper being reeled from the roll to the paper-feed mechanism of the press.

When the paper from one roll is exhausted it requires only a snap relative rotation of the shaft **5** and the core **14**, e.g. a turning of the shaft **5** opposite to that indicated by the arrow **19**, will release the tubes **7** from the core **14**. This will permit an instant withdrawal of the core **14** from the clutch mechanism of the exhausted roll and the insertion of the core **14** of a fresh paper roll on the clutch mechanism, and actuated to clutch the core **14** in the manner above explained.

The elastic rings **18** also have the effect of absorbing vibration and noise created by the fast turning of the paper roll on the shaft bearings.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A clutch mounting for paper printing rolls comprising, a shaft removably positionable on spaced bearings, the intermediate portion of which shaft is polygonal in cross-sectional form, a pair of members rotatively supported on the shaft at the opposite ends of the polygonal-formed portion thereof, a circular series of pins fixed on the opposed faces of the members concentrically of the shaft, elastic rings on the pins, and tubes spanning the space between the members with the tube ends embracively compressing the respective rings and with the tube peripheries in contactive opposition with the respective faces of the polygonal-shaped shaft, whereby when the core of a paper roll is positioned on said mounting any relative rotative movement of the shaft and members will cause a shifting of the tubes on the respective faces of the polygonal-shaped shaft to cause a compression of the rings and a clutching of the tube exterior peripheries with the internal wall of the paper roll core.

2. A clutch mounting for printing paper rolls comprising, a shaft removably positionable on spaced bearings, the intermediate portion of which shaft is of polygonal cross-sectional form, a pair of disks rotatively supported on the shaft at the opposite ends of the polygonal-formed portion thereof, a circular series of pins fixed on the opposed faces of the disks concentrically of the shaft, elastic rings on the pins, and tubes spanning the space between the opposed disks with the tube ends embracively compressing the respective elastic rings and with the tube peripheries in contactive opposition to the respective faces of the polygonal-shaped shaft, whereby when the core of a paper roll is placed onto the mounting any relative rotative movement of the shaft and the disks will cause a shifting of the tubes on the respective faces of the polygonal-shaped shaft to cause a compression of the rings and a clutching of the exterior peripheries of the tubes with the interior periphery of the paper-roll core.

3. A clutch mounting for printing paper-rolls comprising, a shaft removably positionable on spaced bearings, the intermediate portion of which shaft is of hexagonal cross-sectional form, a pair of disks rotatively supported on the shaft at the opposite ends of the hexagonal-formed portion thereof, a circular series of pins fixed on the opposed faces of the disks concentrically of the shaft, elastic rings on the pins, and tubes spanning the space between the opposed disks with the tube ends embracively compressing the respective elastic rings and with the tube peripheries in contactive opposition with the respective faces of the hexagonal-shaped shaft, whereby when the core of a paper roll is placed onto the mounting any relative rotative movement of the shaft and the disks will cause a shifting of the tubes on the respective faces of the hexagonal-shaped shaft to cause a compression of the rings and a clutching of the exterior peripheries of the tubes with the interior periphery of the paper-roll core.

4. A clutch mounting for printing paper-rolls comprising, a shaft removably positionable on spaced bearings, the intermediate portion of which shaft is of hexagonal cross-sectional form, a pair of disks rotatively supported on the shaft at the opposite ends of the hexagonal-formed portion thereof, a circular series of pins fixed on the opposed faces of the disks concentrically of the shaft and extending towards each other, elastic rings on said pins, tubes spanning the space between the opposed disks with the tube ends embracively compressing the respective elastic rings and with a portion of the tube peripheries in contactive opposition to the respective faces of the hexagonal-shaped shaft, whereby when the core of a paper roll is placed on said mounting any relative rotative movement of the shaft and the disks will cause a shifting of the tubes on the respective faces of the hexagonal-shaped shaft to cause a compression of the rings and a clutching of the exterior peripheries of the tubes with the interior periphery of the paper-roll core, and set collars on the shaft abutting the outer faces of the disks.

References Cited in the file of this patent

UNITED STATES PATENTS

1,492,291	Giovannoni et al.	Apr. 29, 1924
1,590,055	Porter	June 22, 1926
2,659,542	Steuber	Nov. 17, 1953

FOREIGN PATENTS

697,837	Germany	Oct. 24, 1940

OTHER REFERENCES

German application 1,008,063, printed May 9, 1957 (Kl. 47C 5).