Aug. 29, 1944. W. F. HELMOND 2,356,842

TYPEWRITING MACHINE

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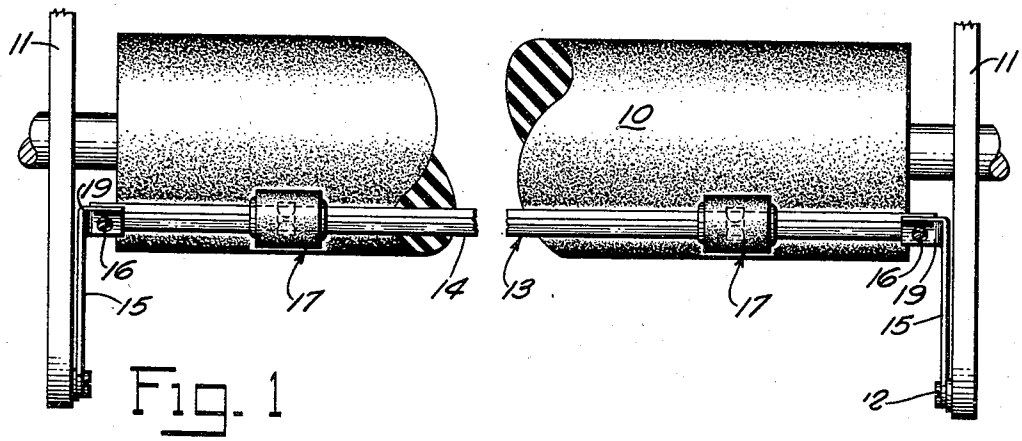

Fig. 1

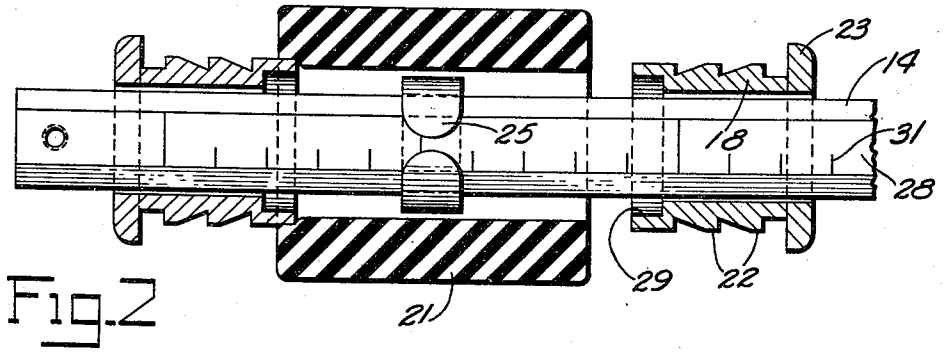

Fig. 2

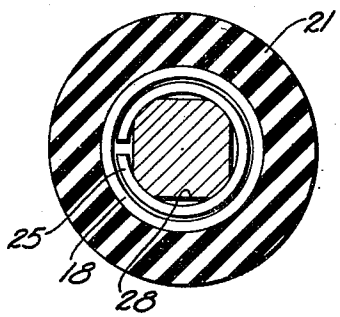

Fig. 4

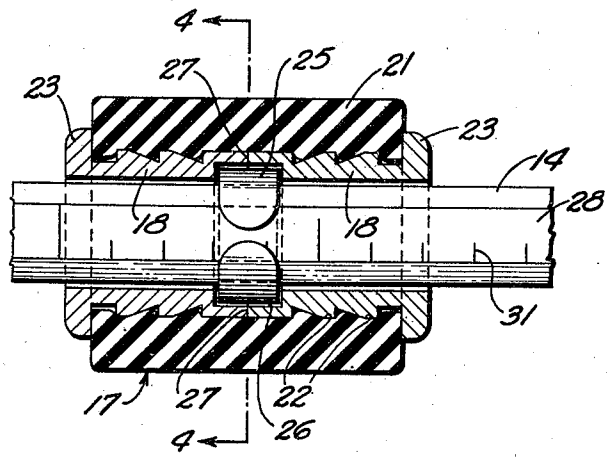

Fig. 3

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TYPEWRITING MACHINE

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12 Claims. (Cl. 197—138)

This invention relates to paper-feeding rolls, particularly such as are used in typewriting and other office machines.

The conventional feed or pressure roll used in typewriters consists of a bushing or core of a hard material surrounded by a hollow paper-feeding cylinder or jacket of rubber or other material having a resilient characteristic. Usually, the bushing or core is provided with radially-projecting end flanges wherebetween the hollow feeding cylinder is located on the core. The rubber or feeding cylinder is applied to the bushing by molding it thereto or by stretching or forcing it over one of the projecting flanges. The process of so applying the feeding cylinder or jacket to a flanged bushing is cumbersome and expensive; and for this reason, it is one of the objects of the invention to provide a feed roll which, although having a flanged core, can be assembled without difficulty, with utmost ease and speed, preferably without special tools.

Some provision is usually made to hold the rolls against shifting along its supporting shaft or arbor. For auxiliary feed rolls, that is for rolls which are usually provided at the delivery side of the platen, such provision usually entails an element which frictionally embraces the feed-roll shaft and which is situated in an annular, internal groove formed in the bore of the feed-roll bushing. The frictional grip such element has upon the shaft is light enough to allow manual shifting of the feed rolls along the shaft to the desired positions. The steps involved in assembling such a roll involves, among a series of operations, the tedious and difficult task of introducing the frictional embracing element into the internal groove within the bushing. With this in view, it is a further object of the invention to provide a feed roll which is conveniently assemblable and which in particular does not call for the tedious task of inserting said frictional element through the bore of the feed roll into said annular groove.

Another object of the invention is to so construct a feed roll that the assembly of the parts thereof entails the least care and effort and preferably requires no tools.

Other objects and advantages will hereinafter appear.

Referring now to the drawing:

Figure 1 is a plan view showing two auxiliary feed rolls supported on a bail and in operative association with a platen,

Figure 2 is a longitudinal cross-section of the feed roll parts, showing these parts in the process of being assembled upon the feed-roll shaft.

Figure 3 is a longitudinal cross-section through the feed roll in its assembled state upon the feed-roll rod, and

Figure 4 is a cross-section of Figure 3 along the lines 4—4.

Referring now to Figure 1, a platen 10 is revolvably mounted in opposite carriage frame ends 11. Upon the front ends of the carriage ends there is pivotally mounted at the points 12 a bail 13 comprising a straight rod 14 and side-arms 15. The rod 14 is secured by screws 16 to ears 19 being bent off from the arms 15. Feed rolls 17 are carried by the bail rod and bear normally upon the front side of the platen 10, but can be lifted off the platen by swinging the bail upwardly and forwardly about the pivot mounts 12.

Directing particular attention to Figures 3 and 4, the novel feed roll comprises two axially-adjacent cores or bushings 18 whereupon there is located a hollow feeding cylinder or jacket 21, preferably of a resiliently pliable material such as a rubber or a cork compound. The jacket 21 preferably embraces the bushings 18 resiliently, wherefore the bushings are opposed against separating by a frictional bond between the jacket and the bushings. The bushings are preferably formed with external teeth 22, and, inasmuch as the feeding cylinder resiliently embraces the bushings, it follows that the teeth 22 will dig into the bore of the jacket and will thereby form a firm mechanical bond between the bushings and the jacket. The bushings adjoin each other as at 27, Figure 3, and radially-projecting rims or flanges 23 provided upon the far ends of the adjoining bushings 18 serve to locate the jacket upon the bushings. The feed-roll bushings 18 are bored to revolvably fit the rod 14; and so that the roll may be retained to revolve in a certain location on the rod 14, a friction element 25 in the form of a spring-collar is provided on the rod 14 and fits between the sides of an internal annular groove 26, the latter being formed by enlarging the bores of the bushings 18 where the latter adjoin each other. The spring-collar 25 comprises a split ring which contacts the rod 14 with such resiliency that the feed roll can be adjusted at will to any desired position along the rod, to remain thereat during the operation of the machine. If it is not a requirement that the feed rolls be adjustable, the collar 25 may be integral with the rod 14 or permanently fixed thereto.

As shown in Figure 2, a convenient method of assembling the roll may comprise: sliding the split collar 25 onto the rod 14, placing the jacket 21 over the rod and collar, and sliding or forcing the two bushings 18 from opposite ends of the jacket into neighboring relation in the jacket, the flanges controlling the extent to which each bushing is insertable into the jacket. In so doing, the split collar 25 becomes imprisoned in the groove or recess 26 formed by the two bushings. The bore or interior of the jacket 21 is preferably smaller than the outside diameter of the bushings 18, so that the jacket bears with resilient pressure on the bushings to hold the bushings and sleeve together, the aforementioned teeth 22 making this more positive. As can be observed from the drawing, the teeth 22 on the bushings are so formed that the bushings can be easily forced into the jacket, but are relatively strongly resisted against separation from the jacket. More specifically, the teeth 22 on the opposite bushings are pointing away from each other and, in the assembled state of the roll, tend to bite deeper into the jacket upon attempting to separate the bushings therefrom. Inasmuch as the bushings slip easily into the jacket, there is almost no tendency of the jacket to crowd and enlarge at the middle. Obviously, a two-part bushing of the above form is much more advantageously assemblable into a jacket than the conventional one-part bushing, which latter, when forced into the jacket, tends to crowd and enlarge the jacket at one end, which, of course, is undesirable.

The feed roll may also be assembled without the feed-roll rod. A good procedure to that effect is, to place first the collar 25 into the recess of one of the bushings 18, and then to force the bushings oppositely into the jacket. It is obvious from the above, and especially also from Figure 2, that the opposite bushings or cores 18 are introduced into the jacket 21 under maintenance of a concentric relationship with the jacket and that, therefore, the opposite bushings 18 expand the jacket equally, wherefore the feed-roll, upon assembly, has a perfectly balanced form and is ready for use without further attention.

As may be observed from the drawing, the feed-roll rod 14 has several flat sides 28 upon some, or all, of which there may be scale markings 31. In this connection, it should be observed that the bushings present a circularly continuous and smooth bore to the rod 14.

It is to be understood that the invention herein shown and described is capable of embodiment in various forms, and that certain features of the invention may be used without others. For example, the bushings 18 may be cemented to the jacket 21 and the latter may consist of a hard material or may have a bore of hard material.

What is claimed is:

1. A feed-roll, comprising, a feed-roll jacket of resiliently pliable material, and two annular bushings for said jacket adapted to be forced in concentric relation into axially neighboring positions in said jacket from opposite ends of the jacket and having teeth digging into said jacket to hold said bushings and jacket together.

2. A feed-roll, comprising, a feed-roll jacket of resiliently pliable material, and two annular bushings for said jacket adapted to be forced in concentric relation into axially neighboring positions in said jacket from opposite ends of the jacket and having teeth digging into the bore of said jacket, said teeth being so shaped that the bushings are easily forced into the jacket but relatively strongly resisted against separation therefrom.

3. In combination with feed-roll locating means adapted to frictionally grip a feed-roll rod, a feed-roll, comprising, a feed-roll jacket of resiliently pliable material, and two annular feed-roll bushings insertable into said jacket in concentric relation therewith, said bushings having teeth for digging into the interior of said jacket to hold said bushings and jacket together, said locating means being adapted to be imprisoned within the feed-roll by inserting said bushings into said jacket from the opposite ends of the jacket, said teeth being formed to render said bushings easier to insert than to withdraw.

4. In combination with feed-roll locating means adapted to frictionally grip a feed-roll rod, a feed-roll, comprising, a feed-roll jacket of resiliently pliable material and two axially neighboring, annular bushings whereon said jacket is mounted, said bushings being adapted to be forced in concentricity into said jacket and forming in an axial direction therebetween a groove for accommodating said locating means, said bushings having teeth for digging into the interior of said jacket so that said bushings will be held together by the resiliency of said jacket, said locating means being adapted to be imprisoned within the feed-roll by concentric introduction of said bushings into said jacket.

5. A feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two hard core-members for said jacket, being diametrically larger than the interior of the jacket, and when assembled with the jacket occupying axially neighboring positions therein, said core-members being adapted to be introduced forcibly into the jacket, from opposite ends thereof, under maintenance of a concentric relationship therewith, and each having exterior tooth-means digging into the interior of the jacket for anchorage in the jacket.

6. A feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two hard core-members for said jacket, being diametrically larger than the interior of the jacket, and when assembled with the jacket occupying axially neighboring positions therein, said core-members being adapted to be introduced forcibly into the jacket, from the opposite ends thereof, under maintenance of a concentric relationship therewith, and each having exterior tooth-means digging into the interior of the jacket, said tooth-means being so shaped that the core-members are easily forced into the jacket but relatively strongly resisted against separation therefrom.

7. A feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two hard core-members for said jacket, being diametrically larger than the interior of the jacket, and when assembled with the jacket occupying axially neighboring positions therein, said core-members being adapted to be introduced forcibly into the jacket from opposite ends thereof, under maintenance of a concentric relationship therewith, and each having an annular flange for engaging one end of the jacket and controlling the extent to which each core-member is insertable into the jacket, said core-members having also tooth-means for digging into the interior of the jacket, for anchorage thereto against axial separation.

8. In combination with a feed-roll rod and feed-roll locating means thereon, a feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two bushings, for the jacket, being

diametrically larger than the interior of the jacket, and being adapted to be slid on the rod and introduced forcibly into the jacket with said jacket and locating means therebetween on the rod, each bushing having exterior tooth-means digging into the interior of the jacket for anchorage therein.

9. In combination with feed-roll locating means adapted to frictionally grip a feed-roll rod in a manner to be forcibly shiftable therealong, a feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two bushings for said jacket, being diametrically larger than the interior of the jacket, and when assembled with the jacket occupying axially neighboring positions therein, said bushings being adapted to be introduced forcibly into the jacket from the opposite ends thereof, under maintenance of a concentric relationship therewith and with said locating means interposed between the bushings, and each bushing having exterior tooth-means digging into the interior of the jacket for anchorage therein against outward movement by axial thrust against said locating means.

10. In combination with feed-roll locating means adapted to be mounted on a feed-roll supporting rod, a feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two bushings for said jacket, being diametrically larger than the interior of the jacket, and when assembled with the jacket occupying axially neighboring positions therein, said bushings being adapted to be introduced forcibly into the jacket from the opposite ends thereof, under maintenance of a concentric relationship therewith and with said locating means interposed between the bushings, and each bushing having exterior tooth-means digging into the interior of the jacket, said tooth-means being so shaped that the bushings are easily forced into the jacket but relatively strongly resisted against separation therefrom.

11. In combination with feed-roll locating means adapted to be mounted on a feed-roll supporting rod, a feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two bushings for said jacket, being diametrically larger than the interior of the jacket, said bushings being adapted to be introduced forcibly into the jacket from the opposite ends thereof, under maintenance of a concentric relationship therewith, and with said locating means interposed therebetween, the bushings when assembled with the jacket being axially abutting each other and forming together at their juncture an internal, annular, locating-means-accommodating groove, said bushings having tooth-means digging into the interior of the jacket for anchorage in the jacket.

12. In combination with feed-roll locating means adapted to be mounted on a feed-roll supporting rod, a feed-roll comprising, a feed-roll jacket of resiliently pliable material, and two bushings for said jacket, being diametrically larger than the interior of the jacket, said bushings being adapted to be introduced forcibly into the jacket from the opposite ends thereof, under maintenance of a concentric relationship therewith, and with said locating means interposed therebetween, the bushings when assembled with the jacket being axially abutting each other substantially along a transverse plane, and forming together at their juncture an internal annular groove of definite width for accommodating said locating means, each of said bushings providing a locating-means-engaging face constituting one side of said groove.

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