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METHOD OF MAKING PLATEN ROLLS

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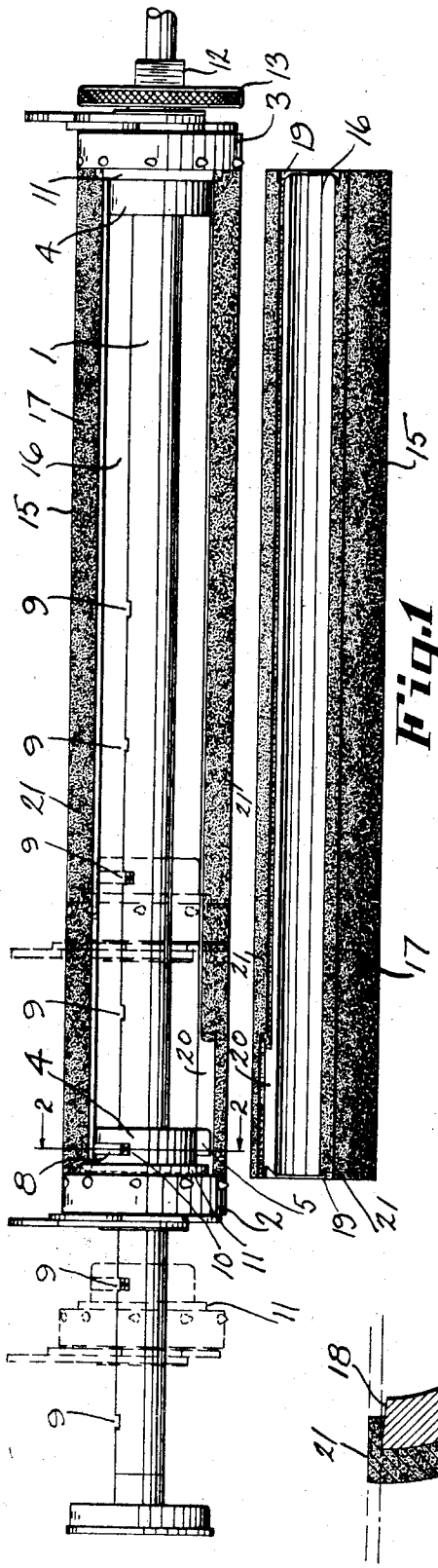


Fig. 1

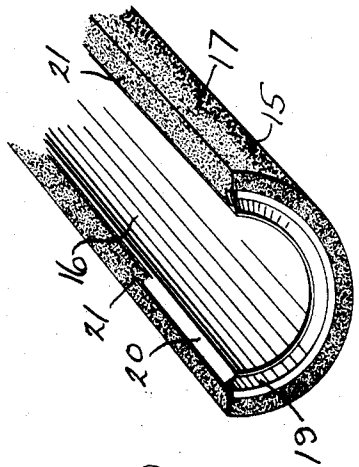


Fig. 4

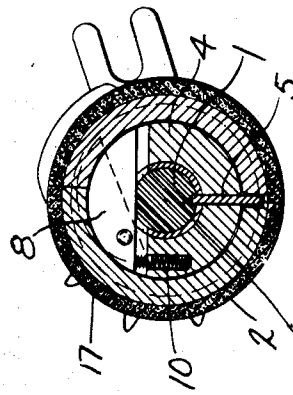


Fig. 2

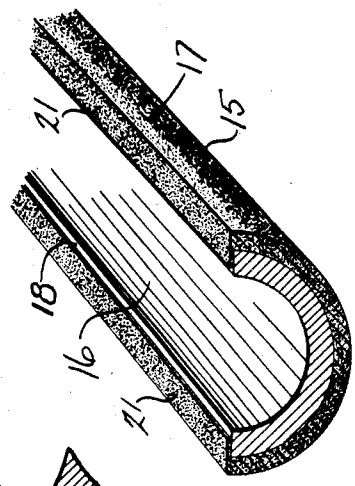


Fig. 3

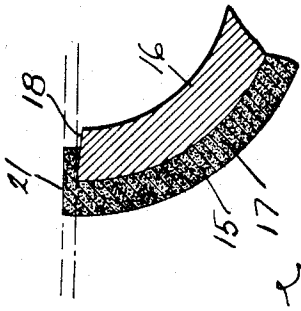


Fig. 5

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METHOD OF MAKING PLATEN ROLLS

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7 Claims. (Cl. 18—59)

This invention relates to platen rolls for writing machines and more particularly to the method of manufacture of removably mounted rolls which are interchangeable with other like platen rolls of different lengths or of different surface characteristics, for use on typewriters, tabulating and computing machines and analogous mechanisms to accommodate stationery of different widths or different surface characteristics or materials.

The commercial production of such interchangeable platen rolls presents some difficult manufacturing problems, which are solved by the structural features and method of manufacture forming the subject matter hereof.

While for illustrative purposes the present platen roll is shown in association with pin wheel feeding devices engageable in marginally punched holes in the writing material, it is to be understood that it may also be employed in association with other suitable mounting heads devoid of feeding pins for use with frictional feeding means of a writing machine.

As herein shown and described, the present platen roll is longitudinally split to facilitate its installation and removal from between the axially adjustable pin wheel units or mounting heads, thereby enabling a succession of such platen rolls of different lengths or of different surface characteristics or degree of hardness to be employed interchangeably with the same pin wheel units or mounting heads.

This application is a continuation in part of copending application Serial No. 687,303, filed August 29, 1933, now matured into Letters Patent No. 2,067,211, of January 12, 1937, and is a division of copending application Serial No. 52,169, now matured into Letters Patent No. 2,173,864 containing article claims. Cross reference is made to copending application Serial No. 68,219, filed March 11, 1936, now matured into Letters Patent No. 2,098,978.

The object of the invention is to improve the construction as well as the mode of production of interchangeable platen rolls whereby they may not only be economically manufactured but will be more efficient in use, of increased durability, greater accuracy, and uniform character, easily interchanged and unlikely to get out of repair.

An important object of the invention is to provide an improved method of securing the rubber or other surfacing material upon the core portions of the platen roll sections to prevent accidental stripping or loosening while in use.

A further object of the invention is to provide an improved method of production whereby uniformity of manufacture, accuracy of parts, and interchangeability of sections is assured.

A further and important object of the invention is to facilitate the commercial manufacture of sectional platen rolls herein described.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the method or process and the steps thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

Referring to the accompanying drawing wherein is shown the preferred but obviously not necessarily the only form of embodiment of the invention,

Fig. 1 is a side elevation of the platen roll assembly forming the subject matter hereof.

Fig. 2 is a transverse sectional view on line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional perspective view of one of the platen roll sections at a mid-length point.

Fig. 4 is a perspective end elevation of one of the platen roll sections.

Fig. 5 is an enlarged detail sectional view.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawing, 1 is the shaft of a platen roll to be mounted in suitable bearings in a writing machine carriage or in the frame of a computing or tabulating machine, upon which are carried a pair of axially adjustable mounting heads 2 and 3. For illustrative purposes these mounting heads 2 and 3 in the present instance are shown as pin wheel units for feeding engagement with marginally punched holes in record material. It is to be understood, however, that the pin wheel feed feature is not essential to the present invention and that the feeding pins may be omitted from the mounting heads. The mounting heads 2 and 3 are splined upon the shaft 1 for unison rotation therewith. The mounting head 2 is formed with an inwardly protecting hub 4 in which is mounted a radially disposed spline or key 5. The spline 5 is fixedly secured in the hub 4 with its inner end projecting interiorly thereof into engagement with a longitudinal keyway or groove in the shaft 1 to afford positive rotative driving engagement therewith, and its outer end projects beyond the periphery of the hub 4 into driving engagement with a slot intermediate the platen roll sections to afford a rotative driving engagement between

the roll sections and the mounting head. The engagement of the inner end of the keyway or spline 5 within the longitudinal slot 6 of the shaft 1 permits axial adjustment of the mounting head 2 upon the shaft while maintaining its driving engagement therewith in all positions of such adjustment. In order to secure the mounting head 2 in any one of several positions of axial adjustment, the hub 4 is provided with a transverse slot in which is pivotally mounted a segment-shaped key or latch 8 engageable in any one of a series of notches 9 in the periphery of the shaft 1 under influence of a spring 10 seated in a bore in the hub 4.

By lifting the latch 8 against the tension of the spring 10 as shown by dotted lines in Fig. 2, the mounting head 2 is released from the shaft for sliding adjustment thereon to different position, in which it is again held by the engagement of the latch 8 in the corresponding notch 9. The inner face of the mounting head 2 is provided with an angular or V-shaped rib 11 in concentric spaced relation with the hub 4 for engagement in corresponding grooves in the extremities of the platen roll sections to be described.

The opposite mounting head 3 is of the same general character, having a corresponding inwardly projecting hub 4 having a key or spline also engaging in the longitudinal slot 6 of the shaft 1 to afford driving engagement. The mounting head 3 is also provided with the concentric angular rib 11 for interlocking engagement with the platen roll section but does not have the splined rotative driving connection therewith. The mounting head 3 is not locked in definite position upon the shaft 1 but is free for sliding movement thereon relative to the opposite mounting head 2. It is held in its position of adjustment by a thrust collar or disc 13 screw-threaded upon the extremity 10 of the shaft 1 and bearing against the outer side of the mounting head.

The platen roll comprises two longitudinally separable semi-cylindrical sections 15, which are interposed between and engaged by the respective mounting heads 2 and 3. The platen roll sections 15 comprise an inner core or rigid support 16 which preferably, although not necessarily, is initially a length of metal tubing severed longitudinally and the severed edges reduced sufficiently to accommodate the overlapping portions of the outer or cover stratum of rubber or the like. The platen roll is not divided exactly upon its diametrical plane. In order to offset the longitudinal joint of the platen roll relative to the line spacing means and the feeding pins, and especially to avoid possible registry of the platen roll joints with the writing lines as the joints or lines of severance of the platen roll pass the writing position, one platen roll section is slightly larger than the other. The standard line spacing of typewriters and such machines is six lines to an inch and the standard size platens used in such machines have a circumference of five and one-half inches. Thus, one revolution of the platen produces thirty-three equally spaced writing lines. If such a platen were divided on a diametrical plane, to produce two sections of equal size there would be sixteen and one-half writing lines in each section which places the platen roll joint coincident with a writing line. In order to overcome this objectionable feature, one of the sections is increased in size with a corresponding decrease in size of the companion section sufficient to prevent the spliting of a writing line by the platen roll joint. For illustrative purposes, but without intent of limiting the invention to any specific dimension, in practice one section of a standard size of platen roll is $16\frac{1}{33}$ of its circumferential dimension while the other section is $17\frac{1}{33}$ thereof. Thus there is provided seventeen complete writing lines in one section and sixteen writing lines in the companion section, the platen roll joint being disposed intermediate the sixteenth and seventeenth writing lines. Being of such slightly different size, the two portions of the roll have the appearance of being equal size and halves of the cylinder, in which case the joint or line of severance of the sections would coincide with writing lines as the platen roll is rotated. Not only is the division of the cylindrical roll at variance with the diametrical plane, but the adjacent marginal faces 18 of the core portion 16 are preferably beveled or inclined inwardly slightly in divergent relation with their radial planes as is shown more clearly in the enlarged detail view, Fig. 5.

The opposite ends of the internal core or supporting members 16 are provided with concentric angular grooves 19 which conform to and receive the concentric ribs 11 of the respective mounting heads 2 and 3 when the platen roll is assembled therebetween. Likewise the adjacent marginal faces of the respective core portions 16 are relieved or cut away as at 20 in Fig. 3 to afford therebetween a slot to receive the outer end of the key or spline 5 when the platen roll sections 15 are assembled one upon the other.

Fixedly secured about the outer convex surfaces of the semi-cylindrical cores 16, preferably by being vulcanized thereto, are the cover strata 17 of rubber or the like, which cover strata are continued at the opposite edges of the core member 16 into overlapping relation with the inwardly beveled marginal surfaces 18 thereof. In this manner the resilient cover portion 17 is clenched over the edge of the core and interlocked therewith so that the danger of accidental loosening or stripping of the resilient surfacing material 17 from the core 16 is minimized. This is especially true when the complementary sections of the platen roll are engaged one with the other in abutting relation and so held between the mounting heads 2 and 3, in which case the overlapping marginal extensions 21 of the resilient cover strata 17 are clamped between the respective core portions 16.

In the manufacture of the sectional platen roll elements 15 the outer faces of the core portion 16 are preferably, although not necessarily, etched, roughened, or otherwise treated to facilitate adhesion of the overlying rubber surface strata 17. The resilient cover 17 of rubber or the like is then molded and vulcanized about the convex face of the core portion 16 and in overlapping relation with the marginal faces 18 thereof as at 21. After being vulcanized, the overlapping marginal extensions 21 of the sections are accurately ground or otherwise finished to afford uniform smooth surfaces coincident with the radial plane of the unit. As before mentioned, in order to offset the juncture lines out of registry with the writing lines as the platen rotates, these finished surfaces of the respective sections preferably do not lie in a common plane but are slightly angular relative to each other.

After the contacting or abutting surfaces of the marginal extensions 21 have been reduced to a uniformly flat smooth surface by grinding or otherwise, the complementary sections of the platen roll are assembled in contacting relation with each other and so held while the outer cylindrical surfaces of the surfacing material 17 is reduced to a smooth finished cylindrical surface throughout by grinding or otherwise. By such method the respective sections of the roll are so accurately fitted and conformed one to the other that the juncture lines or joints are hardly perceptible. These platen roll sections are manufactured in different lengths for use with record material of different width. The surface covering 17 may also be of different materials, or if of rubber they may be of different degrees of hardness or of different surface finish to accommodate the platen rolls to different conditions of use and to use with materials of different character. Likewise, in lieu of a rubber or other resilient surface covering 17, such surfacing material may be of a hard resistant character such as pyroxylin or Celluloid or may be metal surfaced for stencil cutting purposes and the like.

It will be understood that by the present construction of platen rolls such roll sections of different sizes, different character or different surfacing material may be interchangeably mounted between the adjustable mounting heads 2 and 3 as the occasion and character of work to be performed may require.

In order to interchange one pair of platen rolls for another of different size or surface characteristics, the pressure collar or disc 13 is relieved by unscrewing it upon the threaded extremity 12 of the main shaft 1, thereby relieving the mounting head 3 for limited retractive movement upon the shaft 1. By such retractive movement of the mounting head 3 its angular bead 11 is withdrawn from the terminal groove 19 of the platen roll section 5, thereby releasing the section which may be readily moved out of interlocking engagement with the concentric angular bead 10 of the opposite mounting head 2. In the event that the platen roll to be substituted is of less length, the mounting head 2 is axially adjusted upon the shaft 1 by disengaging the transverse latch 8 from the notch 9 and shifting the head 2 upon the shaft to a position corresponding to the length of the substitute roll sections, whereupon the mounting head 2 is again interlocked with the shaft by engagement of its latch member 8 in another of the series of notches 9 in the shaft. The substitute roll sections are then placed in position about the shaft 1 with one grooved end thereof engaging with the angular bead 11 of the mounting head 2, while the opposite mounting head 3 is shifted upon the shaft 1 into abutting relation with the opposite end of the platen roll section, within the concentric groove 19 of which the angular bead 11 of the head 3 engages. The mounting head 3 is thereupon held in such abutting or clamping relation with the platen roll sections by adjustment of the thrust collar or disc 12 upon the screw-threaded extremity 13 of the shaft.

In lieu of finishing the abutting surfaces of the portions 21 upon slightly angular radial planes as before mentioned, for economy and convenience of manufacture the opposite margins 21 may be finished in a common flat plane, which, due to the slight difference in the size of the sections, will be offset slightly from the diametrical plane of the roll. This enables both margins of the respective sections to be simultaneously finished by passing them beneath a cylindrical grinder or the like having uniform operative engagement with both margins.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable but which obivously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described our invention, we claim:

1. The herein described method of producing platen rolls for writing machines including providing a plurality of separable segments of a cylinder molding a surface cover about the convex faces of the segments and over the longitudinal marginal edges thereof, reducing the longitudinal marginal faces of the segments to plane surfaces, fitting a plurality of segments together with their plane marginal surfaces in abutting engagement into a composite circular body and reducing the exterior of the composite body to a uniform cylindrical body.

2. The herein described method of producing a platen roll for a writing machine including providing a plurality of segments of a cylinder totaling somewhat less than a complete cylinder whereby the segments will be separated by intervening spaces when equally spaced in assembled cylindrical relation, covering the convex faces of the segments with a stratum of cover material, extending the cover material inwardly about the longitudinal margins of the segments and assembling the covered segments into a cylindrical roll with the inwardly extending margins of cover material gripped between succeeding sections.

3. The herein described method of producing sectional platen rolls, including the steps of forming a plurality of concavo-convex reinforcement members, reducing the marginal faces thereof to reentrant conformation, applying to the exterior convex faces thereof cover strata, extending the cover strata over the reentrant marginal faces of the reinforcement members into interlocked engagement therewith, and assembling the segments into a cylindrical body with the marginal extensions of the cover strata in abutting relation between succeeding segments.

4. The herein described method of producing platen rolls for writing and imprinting apparatus, including surface finishing the marginal edges of each of two longitudinally separable platen roll segments of different circumferential dimensions on angularly disposed radial planes thereof into matching relation with the angularly disposed marginal edges of the other separable segment of the platen roll, assembling the matching segments with the finished radial faces of each of the segments in contact with the radial faces of the other segment, and finishing the ex-

terior faces of the segments into concentric cylindrical form.

5. The herein described method of producing platen rolls for writing and imprinting apparatus wherein record material is progressively advanced coincident with step by step rotation of a platen roll having an uneven number of circumferentially spaced writing positions thereon, including severing a length of metal tubing longitudinally into unequal halves of cores and into lengths corresponding to the desired platen lengths, forming beveled edges along the longitudinal edges of the semi-cylindrical cores, securing to the convex surfaces of the cores cover strata of rubber with marginal extensions thereof overlapping the edges of the cores, vulcanizing the rubber cover strata, accurately grinding the marginal extensions thereof to coincide with radial planes of the semi-cylindrical unit, assembling two such units into a complete cylinder, and lastly, grinding the exterior face of the assembly to a smooth finished true cylindrical surface.

6. The herein described method of producing platen rolls for writing and imprinting apparatus wherein record material is progressively advanced coincident with rotation of a platen roll, including the step of surface covering longitudinally separable cylindrical segments of a platen roll with a facing material, extending the margins of the facing material about the edges of the segments for clamping engagement between adjacent segments, assembling the covered segments into grouped relation and subsequently surface finishing the exterior faces of the coverings of the segments into concentric relation.

7. The herein described method of producing platen rolls for writing and imprinting apparatus wherein record material is progressively advanced coincident with rotation of a platen roll, including the steps of providing longitudinally separable cylindrical segments of a roll, enclosing the respective segments in surface coverings having marginal flanges overlapping the margins of the segments and providing reentrant angles engaging the margins of the segments in interlocking relation in the reentrant angles of the surface covering, assembling the covered segments in circular grouped relation and subsequently reducing the exterior faces thereof to concentric flush relation.

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