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WRITING MACHINE PLATEN AND METHOD OF MAKING THE SAME

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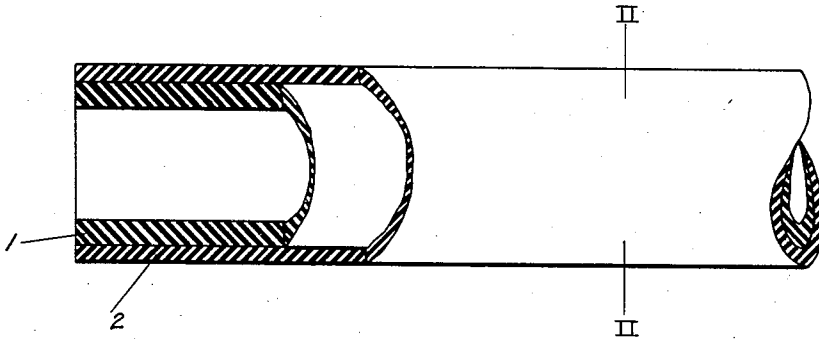


Fig. I

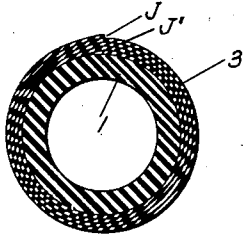


Fig. II

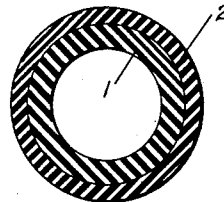


Fig. III

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WRITING MACHINE PLATEN AND METHOD
OF MAKING THE SAME

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5 Claims. (Cl. 18—59)

Our invention relates to platens for writing machines and other machines of like character in which type imprints upon a paper while it is backed by a rubber facing.

5 An object of our invention is to produce a platen of dual composition having an inner or cushion core and an outer shell, resilient but still substantially harder than the core.

10 A further object of the invention is to manufacture such a platen by a method so that the inner cushion core will be to all intents and purposes homogeneously joined to the hard outer shell.

15 A further object of our invention is to produce an article of the character described wherein the inner core is truly circular, the bore thereof for mounting upon the machine is truly circular and truly concentric with the outer surface, and therefore of uniform thickness all of the way around its circumference.

20 A further object is to so produce our new article that the shell thickness will be uniform to an ultimate degree in order that writing performed upon it shall not show variegated effects.

25 Other objects will be apparent from the specification and pointed out in the claims and are particularly to be ascertained by the following recital of critical conditions to be met.

30 As before stated the platen as a whole must be truly cylindrical both inside and outside and the inside and outside surfaces must be concentric. This is also true of the outside surface of the cushion and the inside surface of the shell. If anything approximating a seam or zone of extra thickness of either member of this combination were permitted, a variegated effect would be at once apparent in the writing performed thereon.

40 Since a platen constructed according to our new method will be almost noiseless, will not emboss the paper, and will not be subject to permanent indentation as is a hard platen and will therefore have a much longer life, its advantages will be apparent.

45 The following drawing accompanies and forms a part of this specification in which—

50 Fig. I is a longitudinal view of the platen as manufactured by our new method, sectioned to show the inner and outer parts as separate parts though they are in effect one, when the platen is finished;

Fig. II is a sectional view showing a stage in the process of manufacture as hereinafter explained; and

55 Fig. III is a cross-section of the finished ar-

ticle both sections being presumed to be taken on the line II—II of Fig. I at different times.

In the drawing numeral 1 represents the inner or cushion core, numeral 2 represents the outer or shell tubular member, 3 represents the wrapping of raw stock upon the outside of the core 1 just prior to the second vulcanizing as described hereinafter and J represents the outside lap or joint that is afterwards obliterated in vulcanizing by following out the steps of our method. J' 10 represents the appearance of the inside lap that is eliminated by the same method; this is of major importance.

To carry out our process for making our new article of manufacture the following schedule of 15 steps are necessary:

1. Preparation of cushion stock

Suitable ingredients to make a soft cushion stock, for which a considerable number of formulae are available, should be prepared to vulcanize to about No. 38 shore hardness in fifteen minutes under a proper temperature, the batch well milled and sheeted out to say $\frac{1}{4}$ " thickness between layers of Holland or other liner in preparation for molding and then cut to proper size and weight for molding as required.

A good method of molding is as follows,—

2. Molding

30 a. The cushion rubber is molded in a two piece mold so designed that it separates lengthwise along the cushion and a positively centered core in this cushion also serves as a mandrel and follows the platen through to its completion, or the core may be removed from the cushion after vulcanization and another mandrel substituted if desirable.

40 b. The cushion rubber is then put into a press and cured for a period of approximately 15 minutes at a temperature that is the equivalent of approximately 60 pounds, gage, dry saturated steam pressure, and under a hydraulic pressure of about 2000 pounds per square inch.

45 A suitable composition and process should be followed that will yield a hardness of approximately 38, shore reading, it being understood that variations in outside shell thickness and hardness will affect the desirable qualities of the cushion. The length of the roller will be somewhat greater than the finished length and the thickness of the cushion approximately $\frac{3}{8}$ ". This compresses to a smaller size when the shell is applied as hereinafter described. 55

3. Preparation of shell stock

A suitable formula may be used of which the following is a good example.

5	Smoked sheet.....	16
	Sulphur.....	4
	Litharge.....	4
	Super sulphur #2.....	1
	Lime.....	2
10	Clay.....	26
	Cumar resin.....	1½
	Japan wax.....	1½
	Stearic acid.....	¼

15 It is preferred that the ingredients be mixed in the following sequence: Smoked sheet, cumar resin, stearic acid. Then add all other ingredients which have been put together in one container, except sulphur which is added last.

20 The batch is then milled for a period of 30 to 35 minutes. After a rest period of one or more hours to cool the stock is again put in the mill for warming and refined on the calender three or four times and sheeted out to approximately 1/16" thickness between layers of Holland or other liner. Thickness may be varied according to the desired finished diameter.

4. Application of shell to cushion rubber

30 A cushion, mounted upon a mandrel and vulcanized as hereinbefore described and cooled to room temperature, is thoroughly sanded and/or buffed to remove any overflow or "wings" that may be present at the junction of the two-piece mold, and to roughen the surface.

35 It is thoroughly washed with a conventional rubber solvent to remove all impurities and foreign matter.

40 The cushion is then coated with cement on the outside with a conventional rubber cement and allowed to air dry. The shell stock is then wrapped on the cushion to form a thickness of approximately 1/8", care being taken that the ends are on the same radial line and are directly above and below each other and the outside edge is firmly stitched down as shown in Fig. II.

45 The article, now called the platen, consisting of both the cushion and the shell, which it will be remembered are still mounted upon the mandrel or core, are then wrapped in a piece of thoroughly moistened cloth or liner to several thicknesses under a light tension, that capable of being applied by a workman rolling it in while another workman holds the cloth, will be satisfactory.

5. Vulcanizing

50 The platens are now put into a vulcanizer, properly suspended to eliminate chances of distortion, and vulcanized for a period of time and at a sufficient temperature to properly complete vulcanization of the stock or formula used. Here a most important step in the process takes place. Owing to the character of the cushion rubber previously vulcanized, it remains substantially unchanged during the subsequent vulcanizing process just described, as will be readily understood by anyone familiar with the rubber making art.

70 The first application of heat to the outer shell applied as raw stock causes it to soften and establishes a plastic flow under the light pressure of the wrapping which completely eliminates all traces of the joint J and J' shown in Fig. II, subsequently vulcanizing to the desired hardness, attained by being subjected for a period of

time and a temperature corresponding to the requirements of the stock used.

After completion of this vulcanizing period they are removed from the vulcanizer to cool.

As is well known, it is nearly impossible, where two compounds vary as widely as those hereinbefore suggested, to vulcanize raw stock upon another stock previously vulcanized and make a homogenous juncture, but since our core previously vulcanized is substantially unaffected by the subsequent process of vulcanizing the shell, it retains its shape and size.

After vulcanizing the shell, the platen still mounted upon the mandrel or core is put into a grinding lathe or device equivalent thereto and ground to the true diameter required for the particular machine upon which it is to be used.

Care must be exercised so that the finished roll will have a true outer surface and a hardness as required.

Various other formulas will produce desirable results, the foregoing being given merely as an example. The platen must be ground accurately to eliminate eccentricities.

The following factors affect the qualities of the finished platen and its quality of quietness, also its usefulness in making clear impressions:

First, thickness and hardness of the shell.

Second, thickness and hardness of the cushion. Likewise the shell may be harder or softer if the thickness is varied, to give the same result.

Third, several absolutely new things in our method and its result, all of which are essential to a commercially successful device, are as follows:

1. Pre-vulcanizing the core and preserving the concentric relation of its inner and outer surfaces.

2. Heat applied to the shell stock to induce the plastic flow condition, where it is actually much softer than the core so that no appearance of a seam or juncture of extra thickness will result between the core and the shell.

Noise being the audible effect of vibration, it seems clear that placing the two layers of the platen together in such a manner that their junction surfaces are under stress will result in a gradual variation in density from the surface of the inner or cushion layer to some point within its bulk, contributing to the remarkable silence of this platen in much the same way as would a very large number of layers of minute thickness and progressively varying density at this point.

Having thus disclosed our article and method so that those skilled in the art of rubber manufacture can employ the same and attain our valuable result, what we claim as new and desire to secure by Letters Patent, is,—

1. The method of applying a shell tube to a cushion tube in platen manufacture which consists in cementing the surface of a finished cushion tube, wrapping raw shell stock thereabout, wrapping with cloth to apply compression, softening the shell stock to plasticity by heat and vulcanizing the same by increasing the heat.

2. The process of manufacturing a two-layer cushion type tubular platen which consists of making a cushion tube of materials that will become substantially inert after a first vulcanization and vulcanizing the same, applying wraps of shell layer material under light pressure, softening the wraps by heat to plasticity and vulcanizing in place by increasing the heat, whereby the substantially unchanged cushion tube acts as a mandrel over which the outer shell stock is first flowed in plastic condition and then vulcanized.

3. The method of manufacturing a two-layer writing machine platen having a soft inner core and a relatively hard shell which consists of pre-vulcanizing the core stock in a mold under heat
5 and heavy pressure over a positively centered mandrel, cooling, truing, cleaning and cementing the same, applying raw stock to form a shell
10 under light pressure and re-vulcanizing the assembly under conditions which first soften the outer stock to induce plastic flow, subsequently vulcanizes it relatively hard.

4. The method of manufacturing a cushioned platen which consists of molding a cushion core-tube and curing on a mandrel, finishing the cured
15 tube to size, applying wraps of shell stock to the cured tube, under compressive force, softening the shell stock to plastic flow condition to eliminate joints and vulcanizing to hardness by continuous application of heat.

5. The method of manufacturing a multi-layer circular, tubular platen, having a soft cushion layer and a harder outer layer, with the inner diameter, the contact between layers, and the
5 outer surface in true concentric relationship; which consists of forming the cushion layer, vulcanizing, removing, cooling and truing its outer
10 surface, supporting its inner surface, wrapping with raw shell stock, wrapping the raw shell stock under compression, raising the temperature to
15 soften the raw shell stock and induce plastic flow under the influence of the wrapping, vulcanizing said shell stock to the required hardness and finishing the outer surface of the shell stock true with the support for the inner surface.

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