Nov. 21, 1950 E. B. NICHOLS 2,530,901

MULTIPLE HOLDER WRITING INSTRUMENT
AND METHOD OF MAKING SAME
Filed Feb. 28, 1948

Fig. 2.

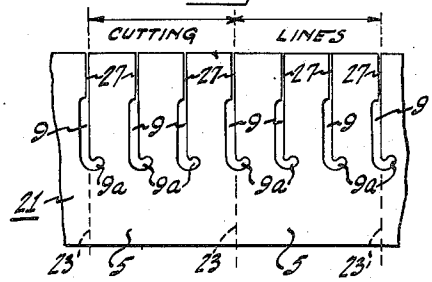


Fig. 7.

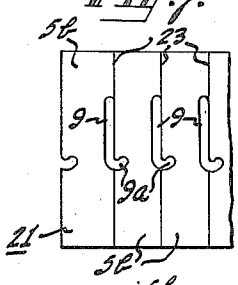
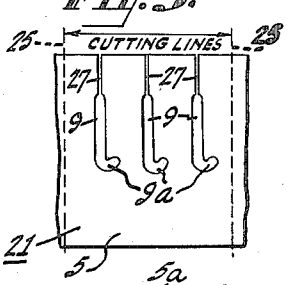


Fig. 5.



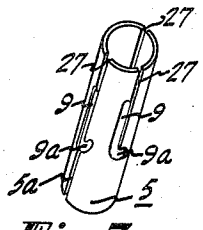


Fig. 3.

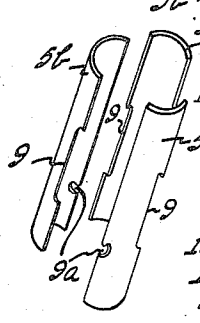


Fig. 8.

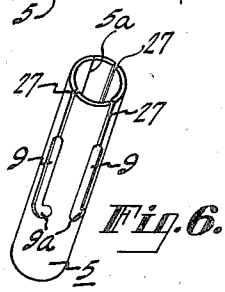


Fig. 6.

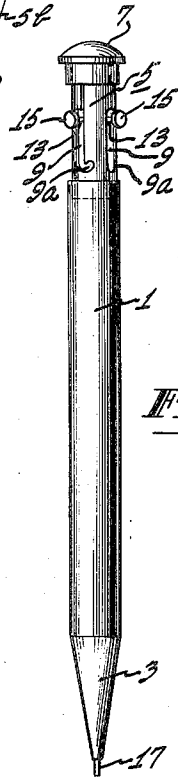


Fig. 1.

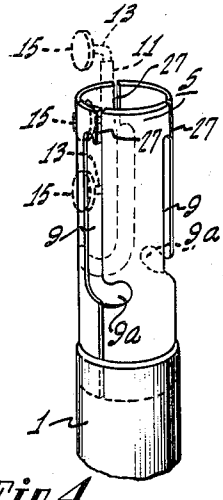


Fig. 4.

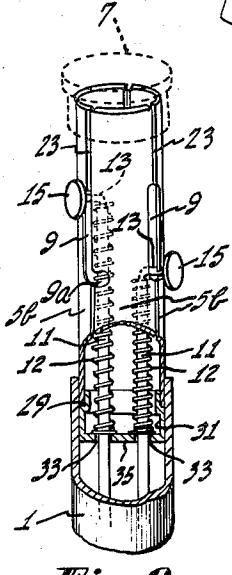


Fig. 9.

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2,530,901

MULTIPLE HOLDER WRITING INSTRUMENT AND METHOD OF MAKING SAME

Edgar B. Nichols, Moorestown, N. J.

Application February 28, 1948, Serial No. 12,059

15 Claims. (Cl. 120—14.5)

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This invention relates to writing instruments, and more particularly to a writing instrument of the type having a plurality of writing elements adapted to be selectively projected to writing position to present writing elements of different colors or types in writing position, as desired, the present invention involving certain improvements over that disclosed in my Patent No. 1,730,679, granted on October 8, 1929.

In this patent, there is disclosed a mechanical pencil having a tubular barrel or casing in which are mounted a plurality of lead holders selectively movable from their respective, normally idle, non-writing positions within the barrel each to a common writing position at the tapered, writing end of the barrel. Movement of each individual lead holder to and from writing position is accomplished by an associated control element which extends through a suitably formed slot in a control member rotatably carried at the upper end of the barrel. Each lead holder includes a lead propelling member for cooperation with a helical feed member mounted in the barrel and common to all the lead propelling members. Normally, that is, when the lead holders are in their idle or non-writing positions, their lead propelling members are out of engagement with the aforementioned feed member. However, when any one of the control elements is moved in its slot to advance its lead holder to writing position, its lead propelling member is thereby brought into cooperative relation with the feed member. Subsequent rotation of the control member on the barrel produces relative rotation between the lead propelling member and the helical feed member to thereby advance the lead.

Heretofore, the tubular, slotted control member for the several lead holders has been formed of tubular (cylindrical) stock in which the requisite slots are formed either by a series of punches known as nibbling, or by a combination of punch and die operations. Both of these methods require hand filing or smoothing by dental burrs, thereby not only being of questionable accuracy, but also slow and expensive because of the high skill which is required.

The primary object of my present invention is to provide an improved method of manufacturing writing instruments of the type described above which will be free from the previously mentioned disadvantages.

More particularly, it is an object of my present invention to provide, in writing instruments of the type set forth, a simplified form of tubular

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control member for controlling the position of the writing element which is in writing position at any time, and an improved method of manufacturing such control member.

Considered from another and broader aspect, it is an object of my present invention to provide, generally, an improved method of forming tubular members having a series of perforations therein, such as slots or other openings, which must be located accurately and uniformly. In the improved writing instrument of my present invention, the tubular member is constituted by the aforementioned tubular control member for the individual writing element holders, and the perforations therein are the slots through which the actuating members of these holders extend, as will be explained more fully hereinafter.

It is also an object of my present invention to provide an improved writing instrument of the type set forth which is simple in construction, which can be formed and assembled easily and quickly whereby the cost of production is greatly reduced, and which is highly efficient in use.

In accordance with one embodiment of my present invention, the tubular control members are produced by (1) punching a strip of flat stock of appropriate width with a plurality of accurately located slots of desired shape and dimensions, (2) severing from the punched strip discrete lengths each suitable for a separate control member, and (3) forming the severed, punched strip lengths into tubes having slots which are accurately located or spaced from one another. According to another embodiment of my present invention the control member is also formed from flat stock which is suitably punched to provide the desired slots and which is cut or severed into a plurality of sectional units two or more of which are suitably curved and then assembled to complete the tubular construction. With either method, the control members can be made much more accurately and rapidly and without the aid of skilled help, thereby greatly speeding up and at the same time reducing the cost of manufacture.

The novel features that I consider characteristic of my invention are set forth with particularity in the appended claims. The invention itself, however, as well as additional objects and advantages thereof, will be better understood from the following description of several embodiments thereof, when read in connection with the accompanying drawing in which

Figure 1 is a side view showing one form of im-

proved pencil according to my present invention,

Figure 2 is a plan view of a strip of flat material out of which my improved control member is formed in accordance with one embodiment of my present invention,

Figure 3 is a perspective view of a completed, tubular control member such as is formed from one of the severed parts of the strip of Figure 2,

Figure 4 is an enlarged, fragmentary, side view showing (1) the control member of Figure 3 assembled with the barrel or casing of the pencil, and (2) the manner in which the lead holder actuating members are placed in position on the control member,

Figure 5 is a view similar to Figure 2 but showing how the strip may be severed to provide discrete control members units according to a slightly modified form of this embodiment of my invention,

Figure 6 is a view similar to Figure 3 but showing a completed, tubular control member such as is formed from one of the severed parts of Figure 5,

Figure 7 is a view similar to Figures 2 and 5 but showing another embodiment of my invention according to which the strip is cut into sections several of which (three in the illustrated embodiment) are required for assembly to provide a single control member,

Figure 8 is a perspective, exploded view of three of the individual sections of Figure 7 arranged to provide a single control member, and

Figure 9 is a view similar to Figure 4 but showing a pencil having a control member such as illustrated in Figure 8.

Referring more particularly to the drawing in which the same reference characters designate the same parts throughout, there is shown, in Figure 1, a pencil comprising a cylindrical casing or barrel 1, a conical tip 3 at the writing end of the barrel, a cylindrical control member 5 rotatably carried by the barrel 1 at its other end, and a cap 7 on the member 5. The control member 5 is provided with several general longitudinally extending, circumferentially spaced, somewhat L-shaped slots 9 each terminating in an offset portion 9a at its lower end. Within the barrel 1 are a like number of lead or other writing element holders 11 (see Figures 4 and 9) each surrounded by a coil spring 12 and each provided at its upper end with a laterally offset shaft 13 terminating in a control button 15. Each of the shafts 13 extends through a separate one of the slots 9. The lead holders 11 are normally in concealed position within the barrel 1 at which time the shafts 13 and their buttons 15 are disposed at the upper ends of their respective slots 9 where they are held by their respective springs 12. To project any writing element to writing position, its button 15 is pushed down along its slot 9 to the lower end thereof against the action of its spring 12 and then laterally to bring its shaft 13 into the portion 9a of the slot. This locks the holder in the writing position at which time the writing element 17 projects out of the tip 3. By turning the control tube 5 on the barrel 1 in one direction or the other, the writing element 17 can be projected more or less from the tip 3 by means of suitable feed mechanism within the barrel 1 all as more fully disclosed in my above-identified patent. When it is desired to change the writing element to one of another type or color, for example, the button of the one then in writing position is returned to its original position thereby to withdraw its holder into the barrel, and the button of the newly selected writing element is moved down to its slot portion 9a to bring its holder into cooperative relation with the feed mechanism.

In accordance with my present invention, the control tube 5 is formed out of a flat strip 21 of suitable metal, such as brass, nickel-silver alloy, or any other suitable metal which has its grain crosswise so that it can be bent easily and deformed into suitable shape as will be described shortly. The width of the strip 21 is such that it will provide control tubes of desired length. The strip is punched by means of suitable dies to provide the slots 9 in transversely extending, longitudinally evenly spaced relation along the strip after which the strip is severed into discrete lengths 5, according to the embodiments of Figures 2 and 5, each to provide one of the control tubes. In the modification of Figure 2, the strip 21 is severed transversely along successive cutting lines 23 which extend along one side edge of every third slot 9 and across its laterally extending portion 9a, this being for a pencil having three leads, for example. In the modification of Figure 5, the strip is severed along cutting lines 25 which are located between third successive pairs of slots in the case of a three lead pencil, between fourth successive pairs of slots for a four lead pencil, etc. In either case, the severed lengths are then bent around into tubular form, as shown in Figures 3 and 6, by bending in a direction considered lengthwise or longitudinally of the original strip 21 around a cylindrical form having its axis parallel to the slots 9 until the ends 5a of each severed length are brought into contiguous relation. The tubes 5 are then ready to be rotatably mounted in the upper ends of the barrels 1 for reception of the writing element holders 11.

In connection with the modification of Figures 2 and 3, it will be noted that the trailing slot portion 9a, left on any severed piece 5 by reason of the fact that the cutting lines 23 extend across the slot portions 9a, mates with the vertical part of the leading slot 9 to form a complete slot. However, whether the tubular control members 5 are formed according to the modifications of either Figures 2 and 3 or Figures 5 and 6, the strip 21 is also formed with a plurality of slits 27, as by shearing, punching, saw cuts or the like, which lead from the upper ends of the slots 9 to the adjacent edge of the strip 21 (that is, the upper ends of the tubes 5 which are formed ultimately from the severed sections of the strip 21, as seen in Figures 3 and 6). The slits 27 permit the upper ends of the tubular members 5 to be sprung apart for reception of the lead holder shafts 13 so that they can be slipped down into their respective slots 9. After the assembly has been made, the cap 7 is fitted over the upper end of the member 5.

In accordance with the embodiment of my invention shown in Figures 7–9, the strip 21 is punched and severed along the cutting lines 23 as in Figure 2, but at each of the slots 9 instead of every third slot. This provides a plurality of discrete control member sections 5b each of which is bent arcuately in a direction longitudinally of the original strip 21 (that is, in a direction at a right angle to the slots 9 lengthwise of the strip). Three such sections 5b are then assembled ad seriatim in contiguous relation to provide the tubular control member for a three lead pencil, four such sections are assembled for

a four lead pencil, etc. These assembled sections are then rotatably mounted with respect to the barrel 1 in a seat 29 between the barrel 1 and a cup 31 which is also rotatably carried in the barrel at the upper end thereof, the lead holder shafts 13 are slipped in through the top after first slipping the springs 12 onto their respective lead holders 11 and passing the lead holders down through openings 33 in the bottom 35 of the cup 31, and the cap 7 is applied to help hold the assembly of sections 5b together. It may be noted, in passing, that the bottom 35 of the cup 31 acts as a stop for the springs 12 to confine these springs between it and their respective shafts 13. A similar arrangement may be employed in connection with the control members of Figures 3 and 6.

From the foregoing description, it will undoubtedly be apparent to those skilled in the art that I have provided simplified control members for the purpose set forth, as well as an improved method of manufacturing the same. Although I have described several embodiments of my invention, it will also be apparent, no doubt, that many other embodiments thereof, as well as further modifications of those herein described, are possible within the spirit of my present invention. Also, while I have described my invention particularly with reference to a multi-lead pencil, it should be understood that it is equally applicable to multi-point fountain pens and other writing or marking instruments. Hence, I desire that the foregoing shall be considered merely as illustrative and not as limiting.

I claim as my invention:

1. The method of manufacturing a writing instrument of the type having (1) a tubular barrel, (2) a plurality of writing element holders therein each movable from a concealed position within said barrel to a writing position at one end thereof and back again, and (3) a control member at the other end of said barrel common to all of said holders and having a plurality of slots therein each in association with a separate one of said holders, said method comprising the steps of punching in a strip of flat, deformable material transversely thereof a plurality of said slots in longitudinally spaced relation along said strip, severing from said strip transversely thereacross discrete lengths of said strip each of which includes at least a part of one of said slots, forming said severed lengths into arcuate members considered in a direction longitudinally of said strip originally, and assembling at least one of said arcuate lengths with said barrel.

2. The invention set forth in claim 1 wherein said strip is severed at preselected ones of said slots to provide said lengths.

3. The invention set forth in claim 1 wherein said strip is severed at successive ones of said slots to provide said lengths.

4. The invention set forth in claim 1 wherein said strip is severed at points between preselected ones of said slots to provide said lengths.

5. The invention set forth in claim 1 characterized in that said strip is also provided with transverse slits extending from one end of each of said slots to the adjacent edge of said strip.

6. The invention set forth in claim 1 characterized in that said strip is also provided with transverse slits extending from one end of each of said slots to the adjacent edge of said strip, and characterized further in that said strip is severed along lines passing through preselected ones of said slits.

7. The method of manufacturing a writing instrument of the type having (1) a tubular barrel, (2) a plurality of writing element holders therein each movable from a concealed position within said barrel to a writing position at one end thereof and back again, and (3) a control member at the other end of said barrel common to all of said holders and having a plurality of slots therein each in association with a separate one of said holders, said method comprising the steps of punching in a strip of flat, deformable material transversely thereof a plurality of said slots in longitudinally spaced relation along said strip, severing from said strip transversely thereacross discrete lengths of said strip each of which includes a plurality of said slots, bending said severed lengths arcuately in a direction considered longitudinally of said strip originally to provide said tubular control member, and mounting said tubular control member on said barrel at the other end thereof.

8. The invention set forth in claim 7 wherein said strip is severed at preselected ones of said slots to provide said lengths.

9. The invention set forth in claim 7 wherein said strip is severed at points between preselected ones of said slots to provide said lengths.

10. The method of manufacturing a writing instrument of the type having (1) a tubular barrel, (2) a plurality of writing element holders therein each movable from a concealed position within said barrel to a writing position at one end thereof and back again, and (3) a control member at the other end of said barrel common to all of said holders and having a plurality of slots therein each in association with a separate one of said holders, said method comprising the steps of punching in a strip of flat, deformable material transversely thereof a plurality of said slots in longitudinally spaced relation along said strip, severing from said strip transversely thereacross discrete lengths of said strip each of which includes at least a part of one of said slots, forming said severed lengths into arcuate members considered in a direction longitudinally of said strip originally, combining a sufficient number of said arcuate members ad seriatim to provide a multi-section completed one of said control members, and mounting said multi-section control member on said barrel at said other end thereof.

11. In a writing instrument of the type having (1) a tubular barrel and (2) a plurality of writing element holders in said barrel each movable from a concealed position within said barrel to a writing position at one end thereof and back again, a control member for said holders adapted to be mounted at the other end of said barrel in common with all of said holders for operating any one of said holders in writing position, said control member comprising a finite strip of material having at least part of a slot therein extending transversely thereof, said strip being curved arcuately in a direction at a right angle to said slot.

12. In a writing instrument of the type having (1) a tubular barrel and (2) a plurality of writing element holders in said barrel each movable from a concealed position within said barrel to a writing position at one end thereof and back again, a control member for said holders adapted to be mounted at the other end of said barrel in common with all of said holders for operating any one of said holders in writing position, said control member comprising a finite strip of de-

formable material having a plurality of slots therein extending transversely thereof, said strip being tubular in form and having its axis parallel to said slots with its ends in contiguous relation, the tubular form of said control member being like that of said barrel.

13. The invention set forth in claim 12 wherein said control member is also provided with slits extending from one end of each of said slots to the adjacent end of said control member.

14. In a writing instrument of the type having (1) a tubular barrel and (2) a plurality of writing element holders in said barrel each movable from a concealed position within said barrel to a writing position at one end thereof and back again, a control member for said holders adapted to be mounted at the other end of said barrel in common with all of said holders for operating any one of said holders in writing position, said control member comprising a plurality of separate sections of strip material each having at least part of a slot therein and each of said sections being curved arcuately on the same curvature in a direction at a right angle to its slot, said sections being disposed ad seriatim in contiguous relation to provide a tubular structure of a shape like that of said barrel, and means for holding said sections together in said contiguous relation.

15. The invention set forth in claim 14 wherein the slot parts of said sections are formed along the edges of said sections, and characterized further in that said slot part of one of said sections mates with the slot part at the contiguous edge of the next adjacent section to provide a complete slot.

EDGAR B. NICHOLS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
882,413	Parkison	Mar. 17, 1908
1,730,679	Nichols	Oct. 8, 1929