July 22, 1952 T. F. VASSAUX 2,603,855

METHOD OF MAKING LIGHTER PLUNGERS

Filed April 22, 1950

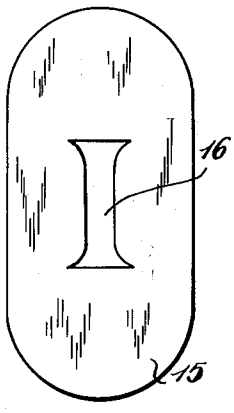


FIG. 1

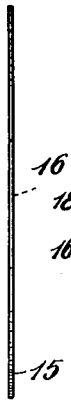


FIG. 2

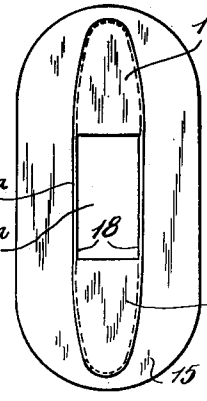


FIG. 3

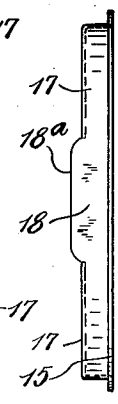


FIG. 4

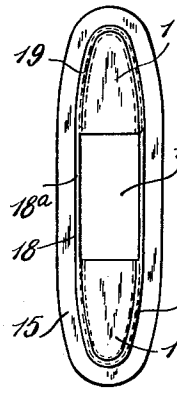


FIG. 5

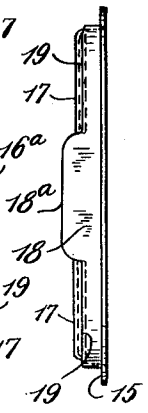


FIG. 6

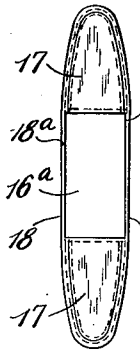


FIG. 7

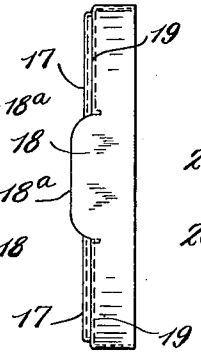


FIG. 8

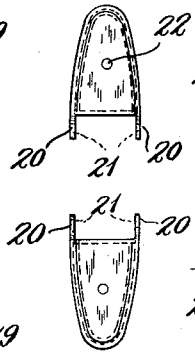


FIG. 9

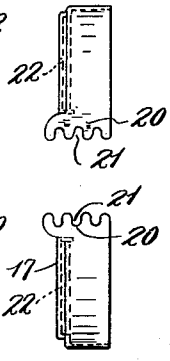


FIG. 10

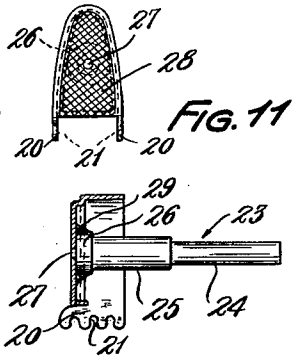


FIG. 11

FIG. 12

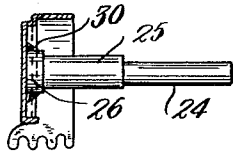


FIG. 13

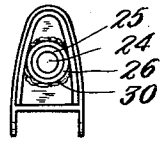


FIG. 14

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METHOD OF MAKING LIGHTER PLUNGERS

Thomas F. Vassaux, Cleveland, Ohio

Application April 22, 1950, Serial No. 157,608

3 Claims. (Cl. 29—148)

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This invention relates to a process or method of making plungers for lighters, such as cigar or cigarette lighters.

Certain cigar or cigarette lighters include reciprocating actuating members generally designated in the trade as plungers. These members or plungers comprise plunger rods which are mounted for sliding reciprocation in the lighter casings and which have on their outer ends actuating cap pieces provided with gear teeth for actuating the lighter mechanisms when the cap pieces and plunger rods are pressed toward the lighter casings.

Heretofore the lighter plungers referred to have been formed of at least three parts and their production has necessitated excessive manufacturing steps, such as the riveting of finish plates on the cap pieces and the like.

An object of the invention is to provide a method or process for making lighter plungers whereby the latter can be produced of only two interconnected parts which are readily manufactured by simple, efficient and inexpensive operations and which two parts are secured together in an exceedingly easy and simplified manner.

A further object is to provide a method or process for making lighter plungers wherein the manufacturing and assembling steps are reduced to a minimum and hence manufacturing costs are maintained at a desired low level.

A further object is to provide a method or process of producing lighter plungers wherein the cap piece is a single part to which it is not necessary to rivet a finish plate and the plunger rod is an easily produced screw machine product while the cap piece and rod are readily, economically and effectively interconnected in an extremely simple manner.

Further and additional objects and advantages of the invention not hereinbefore enumerated will become apparent hereinafter during the detailed description which is to follow and which covers a preferred way of carrying into effect the inventive concept.

Referring to the accompanying drawing,

Figs. 1 and 2 illustrate a sheet metal piece which has been blanked and pierced preliminarily to forming two cap pieces for later assembly with the plunger rod; Fig. 1, being a plan view of the sheet metal piece and Fig. 2 a side edge or elevational view thereof.

Figs. 3 and 4 illustrate the configuration of the blanked and pierced piece of metal after it has been subjected to a first forming operation, Fig. 3 being a plan view and Fig. 4 a side elevational view thereof.

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Figs. 5 and 6 illustrate in top plan and side elevation, respectively, the piece of metal after it has been subjected to a second forming operation.

Figs. 7 and 8 illustrate in top plan and side elevation, respectively, the piece of metal shown in Figs. 5 and 6 but after it has been subjected to a finishing and trimming operation.

Figs. 9 and 10 are top plan and side elevational views, respectively, of the blank shown in Figs. 7 and 8 after it has been subjected to a separating or severing operation to produce two separate cap piece blanks as well as to a tooth notching operation and a piercing operation.

Figs. 11 and 12 are top plan and sectional views, respectively, through one of the cap pieces shown in Figs. 9 and 10 after the pilot nib on the plunger rod has been positioned in the opening in the cap piece and the rod brazed, soldered or otherwise secured to the cap piece and also after the outer surface of the cap piece has been subjected to a serrating or scoring operation to impart a decorative appearance thereto.

Fig. 13 is a view similar to Fig. 12 but showing a plunger rod secured to a cap piece which does not have an opening therein and which rod is not provided with a pilot nib, and

Fig. 14 is an elevational view taken looking from the right hand side of Fig. 13.

In accordance with the method contemplated by the present invention the cap piece of the lighter plunger is a stamping and is made from suitable sheet metal and comprises a single unitary part. The dies employed in making the cap pieces can be of the progressive type or can be in the form of a series of compound dies. One way of carrying the invention into effect is to blank from a large piece of sheet metal a number of small pieces 15, see Figs. 1 and 2, and with said pieces 15 each shaped and sized so as to eventually produce after a severing operation two cap pieces.

In blanking the pieces 15 from the large piece of sheet metal each piece 15 is pierced so as to be provided with a slot 16 of the shape indicated in Fig. 1. The blanked and pierced pieces 15 are then placed in suitable forming dies and subjected to the first forming operation, after which they have the configuration shown in Figs. 3 and 4. When the first forming operation has been performed on the pieces 15 they will have at opposite ends of the slot 16 and extending longitudinally and centrally of the piece 15 channel-shaped portions 17 while the slot 16 will

have assumed a rectangular configuration as indicated at 16a and said slot 16a will have its longitudinal sides defined by upstanding walls 18, the outer ends of which are shaped as indicated at 18a.

Following the first forming operation the pieces 15 are subjected to a second forming operation to impart thereto the configuration indicated in Figs. 5 and 6. The second forming operation widens the channel portions 17 and provides an external shoulder 19 extending around each channel portion 17 as clearly indicated in Figs. 5 and 6. The pieces 15 following the second forming operation are then subjected to a finish trimming operation after which each piece 15 will have the configuration shown in Figs. 7 and 8.

It will be understood that in subjecting the pieces 15 to the trimming operation they are placed in suitable trimming dies which function to sever from the pieces the flange or flash extending from the edges thereof that are located at the open side of the channel portions.

The blank in the form shown in Figs. 7 and 8 is then placed in a suitable die which may be of the cam type to separate it into individual cap pieces, the separation or severance taking place in the walls 18 of the slot 16a so as to provide on the adjacent ends of each cap piece and on both sides thereof extending lug portions 20 formed from the remaining portions of the walls 18. In this same operation the lug portions 20 have cut therein gear teeth 21 which when the cap piece is assembled in a complete lighter meshes with cooperating gear teeth that are operatively formed on and connected with the operating mechanism of the lighter as will be well understood in the art. Also in this same operation each cap piece is pierced to provide in the bottom of the channel an opening 22 located accurately with respect to the teeth 21.

A plunger rod 23 formed perferably by screw machine operations and having an end portion 24 of small diameter, an intermediate portion 25 of large diameter and a second end portion 26 of still larger diameter is placed in a suitable assembling and pressing die, with the portion 26 arranged to be located intermediate the side walls of a cap piece.

The portion 26 of the plunger rod is provided with a pilot nib 27 and when the cap piece is positioned in the die with the rod located as shown in Figs. 11 and 12, the nib 27 will extend into the opening 22 with a pressed fit when the cap piece and rod have been struck by the closing of the dies. The die used for this last mentioned operation also finish forms the top and sides of the cap piece and produces on the outer surface of the cap piece decorative serrations or markings, as indicated at 28 in Fig. 11.

The cap piece and the plunger 23 attached thereto by the pressed fit referred to can now be brazed, welded or otherwise securely interconnected as indicated at 29 in Fig. 12. The decorative serrations on the outer surface of the cap piece act to finish the appearance of the cap piece and obviate the necessity of riveting to the cap piece a finish plate as has been the practice heretofore.

In Figs. 13 and 14 the plunger is illustrated as not having the pilot nib 27 and the cap piece as not being provided with the opening 22. In this form of construction the plunger end 26 of large diameter is so dimensioned as to have a close fit in the channeled cap piece, wherefore the cap piece and plunger can be securely interconnected by brazing, welding, soldering or other means as indicated at 30 in Figs. 13 and 14.

Although a preferred form of carrying out the method has been set forth herein, it will be understood that the operative steps may be varied somewhat in accordance with the scope of the appended claims.

Having thus described my invention I claim:

1. The method of making lighter plungers which comprises blanking from sheet metal by means of suitable dies a flat blank of predetermined size and of substantially oval shape and simultaneously by said dies providing therein a slot of substantially I-shape; then subjecting the slotted blank to suitable forming dies to provide therein channel-shaped portions extending from each end of said slot in longitudinal extension thereof and to change the configuration of said slot to a substantially rectangular one having upstanding side walls extending beyond the plane of the base of the channel-shaped portions; then subjecting the formed blank to suitable trimming dies to remove excess material from the free edges thereof; then subjecting the trimmed blank to suitable dies to separate the blank midway of the ends of said slot and said side walls into separate cap piece blanks while simultaneously cutting gear teeth in the separated ends of said side walls; then placing each separated cap piece blank together with a plunger rod having a portion which interfits a portion of the cap piece blank in a suitable die to finish form the top and sides of the cap piece, press fit the plunger portion to the cap piece portion and decoratively serrate the top of the cap piece; and then uniting the cap piece portion to the plunger rod portion by suitable means such as brazing.

2. The method of making lighter plungers which comprises blanking from sheet metal by means of suitable dies a flat blank of predetermined size and of substantially oval shape and simultaneously by said dies providing therein a slot of substantially I-shape; then subjecting the slotted blank to suitable forming dies to provide therein channel-shaped portions extending from each end of said slot in longitudinal extension thereof and to change the configuration of said slot to a substantially rectangular one having upstanding side walls extending beyond the plane of the base of the channel-shaped portions; then subjecting the formed blank to a second set of suitable forming dies to further form the blank to widen the channel-shaped portions thereof and to provide thereon external shoulders; then subjecting the formed blank to suitable trimming dies to remove excess material from the free edges thereof; then subjecting the trimmed blank to suitable dies to separate the blank midway of the ends of said slot and said side walls into separate cap piece blanks while simultaneously cutting gear teeth in the separated ends of said side walls; then placing each separated cap piece blank together with a plunger rod having a portion which interfits a portion of the cap piece blank in a suitable die to finish form the top and sides of the cap piece blank, press fit the plunger portion to the cap piece blank portion and decoratively serrate the top of the cap piece blank; and then uniting the cap piece blank portion

to the plunger rod portion by suitable means such as brazing.

3. The method of making lighter plungers which comprises blanking from sheet metal by means of suitable dies a flat blank of predetermined size and of substantially oval shape and simultaneously by said dies providing therein a slot of substantially I-shape; then subjecting the slotted blank to suitable forming dies to provide therein channel-shaped portions extending from each end of said slot in longitudinal extension thereof and to change the configuration of said slot to a substantially rectangular one having upstanding side walls extending beyond the plane of the base of the channel-shaped portions; then subjecting the formed blank to suitable trimming dies to remove excess material from the free edges thereof; then subjecting the trimmed blank to suitable dies to separate the blank midway of the ends of said slot and said

side walls into separate cap piece blanks while simultaneously cutting gear teeth at the separated ends of said side walls and providing an opening in the top of each of said separate cap-piece blanks and which is located centrally of the base of the channel-shaped portion of the separate blank and at a predetermined distance with respect to said gear teeth; then placing each separated cap piece blank together with a plunger rod having a pilot nib on an end thereof which will interfit said opening in a suitable die to finish form the top and sides of the cap piece blank, press fit the pilot nib into said opening and decoratively serrate the top of the cap piece blank; and then uniting the cap piece to the plunger rod by suitable means such as brazing.

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No references cited.