

June 25, 1940.

R. SPRENGER

2,205,891

PROCESS OF MANUFACTURING GUNSTOCKS

Filed Jan. 22, 1938

2 Sheets-Sheet 1

Fig.1.

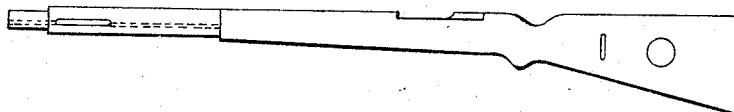


Fig.2.

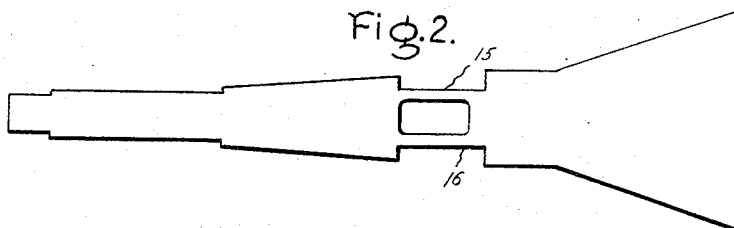


Fig.3.

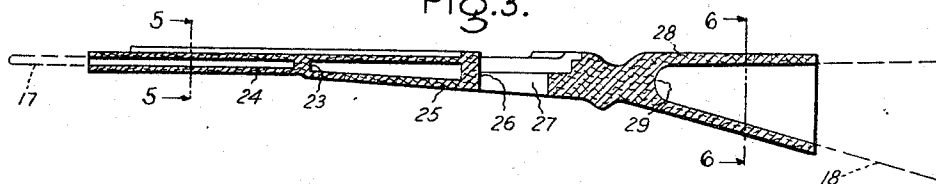


Fig.6.

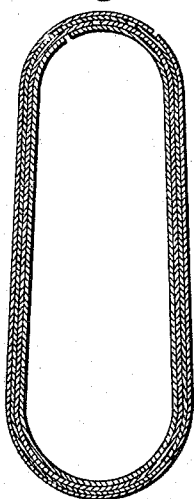


Fig.4.

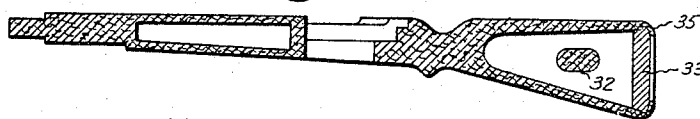
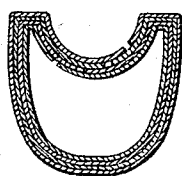


Fig.5.



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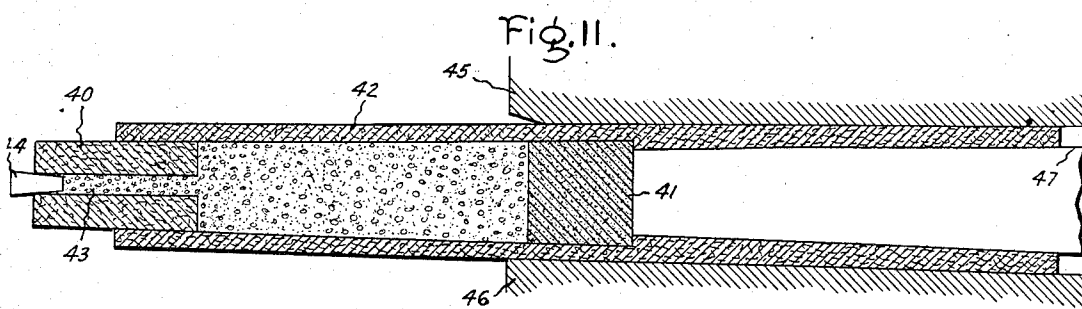
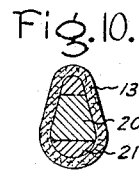
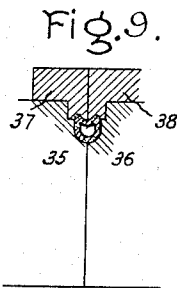
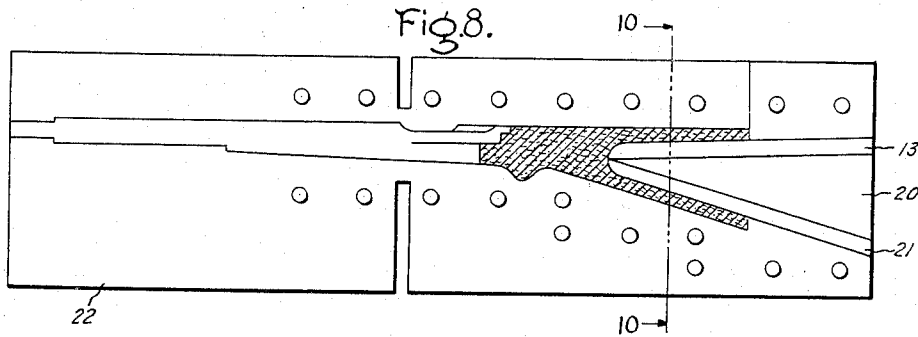
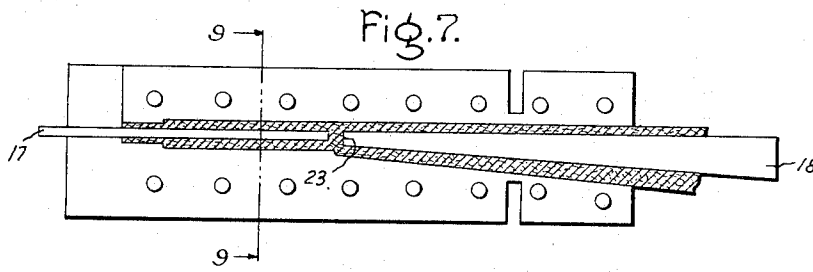
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PROCESS OF MANUFACTURING GUNSTOCKS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,205,891

PROCESS OF MANUFACTURING GUNSTOCKS

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Application January 22, 1938, Serial No. 186,429
In Germany February 5, 1937

2 Claims. (Cl. 18—56)

My invention relates to molded gunstocks and more particularly to an improved process of making them.

One object of my invention is to provide an improved core for use during the molding process.

Another object of my invention is to provide an improved joint between sections of the gunstock.

For a better understanding of my invention together with other and further objects thereof, reference is had to the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

In the accompanying drawings, Fig. 1 is a side elevation of a molded gunstock; Fig. 2 is a plan view of a lamination of fibrous material used in the process of making the gunstock of Fig. 1; Fig. 3 is a cross-sectional view of a partly finished gunstock; Fig. 4 is a cross-sectional view of a finished gunstock; Figs. 5 and 6 are enlarged cross-sectional views of the gunstock of Fig. 3 taken along line 5—5 and 6—6, respectively; Fig. 7 is a cross-sectional view of the die forming the barrel end of the stock; and Fig. 8 discloses a cross-sectional view of a die forming the shoulder end of the stock; Fig. 9 is a cross-sectional view of the die taken along line 9—9 of Fig. 7; Fig. 10 is a cross-sectional view taken along line 10—10 of Fig. 8; and Fig. 11 is a cross-sectional view of the front end of a stock in the process of molding illustrating a novel removable core in use during the molding process in accordance with my invention.

In the making of a gunstock heretofore, hard woods have had to be used, and in view of the fact that these woods are becoming more and more difficult to obtain, other methods of making these stocks have become important. Furthermore, in the rough handlings of guns such as occurs in army weapons, the gunstocks have been subject to splitting and warping due to their absorption of moisture and various other rough handling. Substitution of metal stocks covered with rubber or similar materials has not been successful in view of the fact that the coverings could not be made satisfactorily. In accordance with the process, which the present invention improves, the entire stock is built of a moldable compound which is a fibrous material saturated with one of the many synthetic resins such as a phenolic condensation product for example. The fibrous material used in accordance with one phase of my invention is spun paper fibers. These fibers may be merely spun, or may be spun and

woven into fabric which is then cut into sheets and assembled so that the edges thereof are offset, saturated with resin and then molded.

As above stated, the fibers are preferably arranged in sheets as shown in Fig. 2, the shape of which is designed to conform to the ultimate shape of the gunstock. Thus, for example, the sheet is tapered from the butt end to the rifle end of the stock, being reduced at points corresponding to the design of the trigger mechanism and the barrel support. Notches 15 and 16 are cut so as to form initially the opening through which the breech block and trigger mechanism may be inserted with a minimum amount of machining operation.

When a sufficient number of these laminations have been formed, they are placed into a die, as shown in Fig. 7, for example, and cores 17 and 18 are inserted to form the hollow stock, and thereby reduce the weight thereof. This forming process takes place in stages, so that only a portion of the dies is heated to form the necessary portion of the stock while the remainder of the die remains cool. Thus, in Fig. 7, with the aid of cores 17 and 18, the forward portion of the gunstock is molded. In Fig. 8 the butt end of the stock is molded with the aid of cores 13, 20, and 21, while the forward end 22 of the die holding the forward portion of the stock is cooled. In this process, the completed stock is molded from the sheets shown in Fig. 2, and in order to strengthen the stock, core pieces are inserted between sections of different diameter of the stock. In Fig. 7, for example, a core member 23 is inserted between the two sections of the forward end of the stock which have different diameters, and is thereby completely welded into the side walls of the gunstock. This core member may, of course, be made of sheet material rolled into the proper size, or it may be a mass of short fibers saturated with the synthetic material and given proper shape so that upon the application of heat and pressure by the dies, it will unite with the sheets or laminations of the material shown in Fig. 2.

Fig. 3 is a cross-sectional view of a completed gunstock, and discloses the sections 24, 25, of the forward end of the stock as being fully united with the core 23 and a similar core 26. The slot 27 through the stock between the butt end 28 and the forward end 25 is machined in order to receive the breech block. A core 29 is united with the butt end of the stock in order to form a solid mass capable of receiving the shock of the discharging weapon.

In Fig. 4 I have disclosed a method of finishing the butt end of the stock. In this figure, the core member 32 is inserted in the middle of the butt for the purpose of strengthening it and for the purpose of receiving identification stamping or plate which is necessarily attached to each weapon. The core member 33 is used to close up the end of the hollow butt, and as shown is held in place by folding the end 35 of the laminated materials over the core member during the molding process.

Figs. 5 and 6 are enlarged cross-sectional views of the gunstock of Fig. 3 taken along lines 5—5 and 6—6. These views show clearly the laminations of which the stock is built up and the manner of offsetting the abutting edges, or joints, so as to avoid a weak spot in the finished article.

Fig. 9 is a cross-sectional view along line 9—9 of Fig. 7, disclosing the die members 35, 36, 37, and 38. In the molding process, the dies 35 and 36 are placed and held by the core members 17 and 18. After the ends of these laminations are suitably overlapped, the die members 37 and 38 are inserted and force the ends of the laminations inwardly to finish the gunstock in this section.

Fig. 10 discloses a section of the die taken along line 10—10 of Fig. 8. In this section of the gunstock, cores 13, 20, and 21 are used, section 20 forming a wedge forcing the cores 19 and 21 against the walls of the core in order to furnish the necessary pressure during the molding process.

Fig. 11 discloses another phase of my invention. Fig. 11 is a sectional view of a gunstock of which one section is molded and the second section is in the dies ready to be molded. Plugs 40 and 41 are provided at the ends of the completed section 42. Plug 41 is solid, but plug 40 is provided with an opening 43 which is closed by a removable stopper 44. The space between the plugs 40 and 41 is filled with a granulated material which may be sand, or small shot. When pressure is applied

by the dies 45 and 46, to the second section of the gunstock, this material furnishes a backing or a support for the plug 41, so that the plug will not be displaced. After the molding process, this core may be removed through the opening in the plug 40 in order to lighten the stock. A solid tapered core 47 is used to mold the other end of the stock, as in the method shown in Fig. 7.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A process for forming gunstocks of laminated material impregnated with a phenolic condensation product which includes preforming said laminations and rolling them into a hollow structure divided into sections by spaced plugs, applying heat and pressure to a section of said laminations, filling the space between plugs in said finished section with a removable core material and applying heat and pressure to an adjacent section of said structure whereby the plugs in said structure are maintained in position during the successive applications of pressure to adjacent sections of the said structure respectively.

2. A process for forming a gunstock of laminated material impregnated with a phenolic condensation product which includes stacking preformed laminations and rolling them into a hollow structure, placing the edges of said laminations into abutting and offset relationship, plugging the ends of said hollow structure thereby dividing the space within said structure into a totally enclosed space and an open-ended space, applying heat and pressure to the gunstock section between plugs which form the totally enclosed space, thereafter filling said totally enclosed space through an opening in one of the plugs with a removable granulated core material, and thereafter applying heat and pressure to the open-ended space section of said gunstock whereby the plugs in said stock are held in their respective predetermined positions during the second operation by action of said removable core.

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