May 21, 1935. J. T. RIDDELL 2,001,977

METHOD OF MAKING SHOE CLEATS OR SIMILAR ARTICLES

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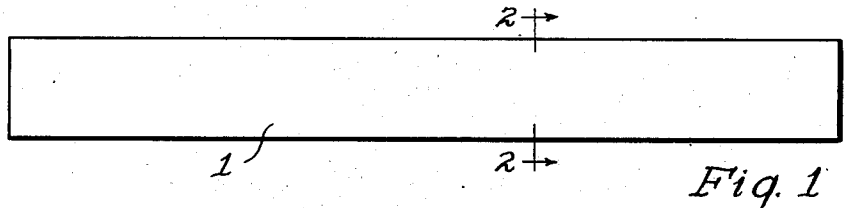
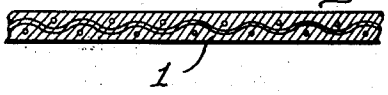


Fig. 1

Fig. 2



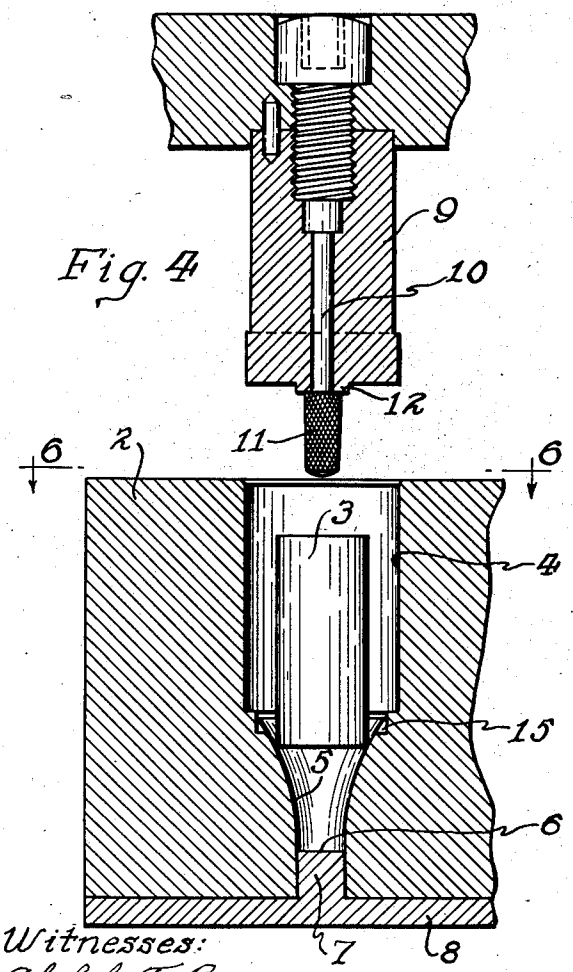
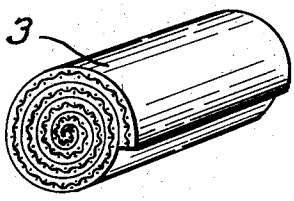


Fig. 4

Fig. 3



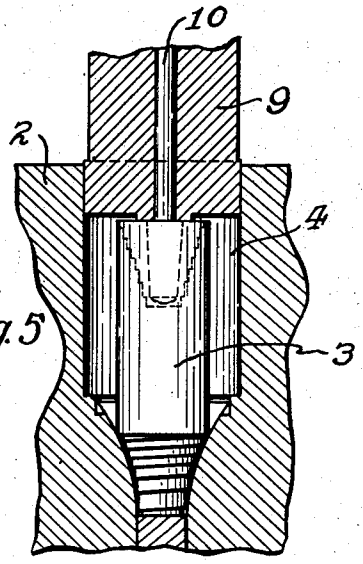


Fig. 5

Witnesses:
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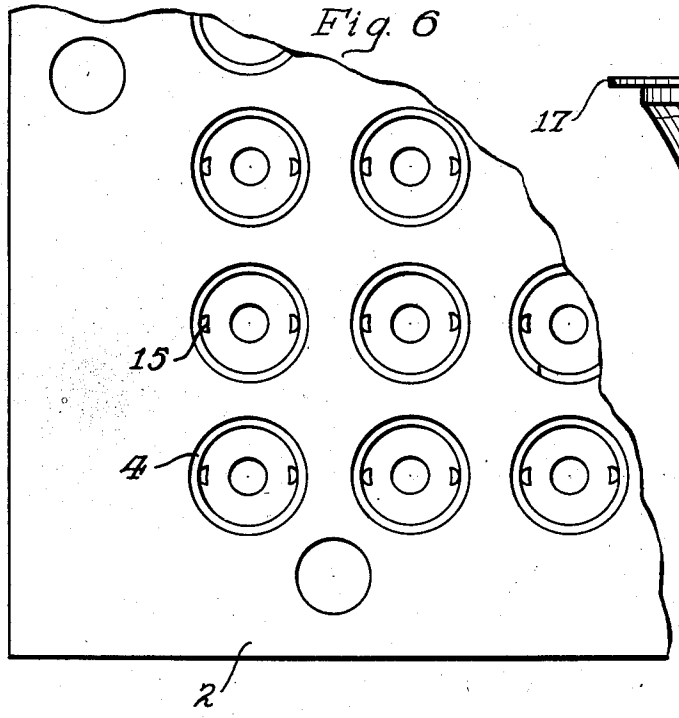
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METHOD OF MAKING SHOE CLEATS OR SIMILAR ARTICLES

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Fig. 6



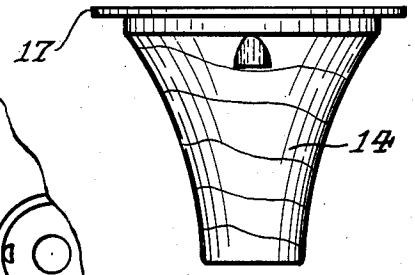


Fig. 7

Fig. 8

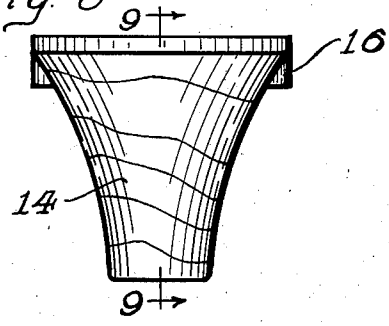
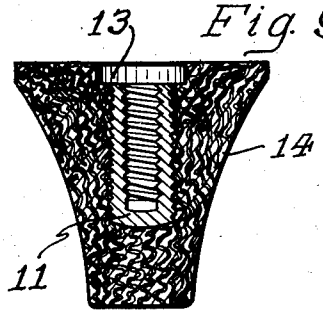


Fig. 9



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UNITED STATES PATENT OFFICE

2,001,977

METHOD OF MAKING SHOE CLEATS OR SIMILAR ARTICLES

John T. Riddell, Chicago, Ill.

Application October 9, 1933, Serial No. 692,795

2 Claims. (Cl. 18—59)

This invention relates to the making of the cleats which are secured to the soles of shoes used in outdoor games, such as football and incidentally to the canvas reinforced phenolic condensation products having a conical, or tapered frustum shape.

The main objects of the invention are to provide an improved construction for football shoe cleats and method of making same; and to provide an improved arrangement of the reinforcement in such cleats, whereby increased strength and durability are provided for withstanding the strains and abuse to which the cleats are subjected in use.

The drawings show the stock used in forming such articles, the die forms and the appearance of one sample of the product which may be produced by the improved forming method.

Figure 1 of the drawings shows in plan a Bakelite treated fabric tape.

Fig. 2 is a greatly enlarged sectional detail on the line 2—2 of Figure 1.

Fig. 3 shows in perspective the tape rolled into cylindrical form for reception by a mold. In this view the thickness of the tape is greatly exaggerated for the sake of the illustration.

Fig. 4 is a fragmentary detail in section of the forming dies in spaced relation and with the roll of tape resting in the place from which it is forced into the mold.

Fig. 5 is a vertical sectional view showing the dies in an intermediate position and the partly formed article therein.

Fig. 6 is a fragmentary plan view of the matrix element of the gang die or mold construction employed in quantity production.

Fig. 7 is a side view of the article as it comes from the die with an excess of material which is later removed in a trimming operation.

Fig. 8 is a side view of the finished article after trimming.

Fig. 9 is a vertical section of the finished article as indicated by the line 9—9 of Fig. 8.

In the drawings, 1 represents a strip of canvas tape which is impregnated with raw Bakelite or other phenolic derivative substance in condition for softening by heat, shaping and later hardening or curing. Such treated canvas is now available and used in the manufacture of many different articles such as gears or cleats of the general type herein illustrated. Usually, however, such structures are built up of flat layers pressed together flatwise or the materials are comminuted and molded as a mixture.

In the present invention, the tape 1 is rolled into the form of a compact cylinder such as shown by Fig. 3 and of an accurately predetermined weight calculated to fill the mold with a slight surplusage which is finally trimmed off as a marginal fin at the base of the cleat. The die or matrix 2 which receives the tape roll 3 is provided with a cylindrical recess 4 terminating in an inwardly curved tapered formation 5. The bottom 6 of the opening in the mold is closed by an upwardly projecting stud 7 carried by a plate 8 secured to the bottom of the mold. Plate 8 is removable so that plates having studs 7 of different lengths may be substituted for the one shown, and by such means vary the length of the cleats which are formed in the mold.

The die element or plunger 9 which fits the recess 4 is provided with a centrally projecting rod or stud 10 for supporting a socket member or thimble 11. The thimble 11 remains in the cleat formed and is internally threaded for receiving a screw by which the finished cleat is attached to a shoe. The outer surface of the thimble 11 is preferably corrugated or knurled and its lower end is preferably of greater diameter than the upper end so that it will become firmly anchored and resist turning with reference to the cleat body within which it is embedded.

It will be observed from Figs. 4 and 5 that the roll 3 of impregnated fabric is of somewhat less diameter than the guide cylinder 4 and is of greater length than the matrix 5. When the plunger 9 moves downwardly into the recess 4 and against the end of cylinder 3, the thimble 11 on rod 10 presses the innermost convolutions of the cylinder 3 endwise into the tapered end 5 of the recess in the mold.

Further movement of the plunger crushes the cylindrical mass of fabric and causes the Bakelite to flow and fill all interstices to form a solid of great strength, the fabric taking the wavy form shown in Fig. 9 and being most densely compacted at the apex of cleat where greatest strength is required.

Under the temperature and pressure maintained during this initial forming step, the phenolic resin ingredient in the cylinder 3 becomes plastic and completely fills the open part of the mold below the plunger 9. While the mold is steam heated, at about 350° F., a pressure of 500 pounds per square inch is maintained on the material within the mold for about two minutes.

This temperature and pressure also bring about the desired plastic condition of the treated canvas for forming purposes. At the end of this

period the pressure is increased to approximately 4000 pounds per square inch without otherwise adding to the temperature of the mold, and such pressure is maintained from six to eight minutes which is the time required for completely curing and hardening the phenolic resin ingredients in the mold in case the substance used is Bakelite. Variations in temperatures and pressures are made according to the material carried by the canvas which in some cases is varied according to the rigidity or the elasticity desired in the finished product and which is a well understood proceeding.

The plunger has a boss 12 which forms a countersink 13 at the screw receiving or base end of the cleat 14. At the sides of the recesses 4 in the mold 2 are indentations 15 to provide for the lugs 16 on the cleat 14. The purpose of the lugs is to provide finger holds or shoulders to fit a tool used for screwing the cleats onto receiving screws.

In practice a slight excess of the stock material is provided and forms a fin or projecting flange 17 at the base of the cleat as indicated in Figure 7. When this flange is trimmed off, the finished article appears as shown by Figure 8.

Although but one specific embodiment has been herein shown and described, it will be understood that numerous details of the structure and method disclosed may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. The method of making shoe cleats or similar articles, which consists in providing an axially tapered mold, forming a cylindrical roll of fabric impregnated with a resinous phenolic derivative and of substantially uniform diameter and of length greater than that of the mold and of quantity sufficient to fill the mold, seating the roll axially within the mold, pressing a metallic core axially into the roll and thereby projecting its central portion along the mold, applying heat and endwise pressure to the roll and core to force the core within the mold and to crush the roll and flow the phenolic material so as to completely fill the mold, and then allowing the phenolic material to set.

2. The method of forming tapered articles of the class described comprising rolling into cylindrical form a tape which carries a plastic molding material, tapering the cylinder by inserting a core by endwise pressure thereon and thereby projecting the center convolutions into a tapered mold, applying heat and endwise pressure to the material in the mold and allowing the material to set while under pressure.

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