

G. F. & A. J. GROVE.
PRESS TOOL FOR THE MANUFACTURE OF PUSH BUTTONS.

APPLICATION FILED JUNE 6, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

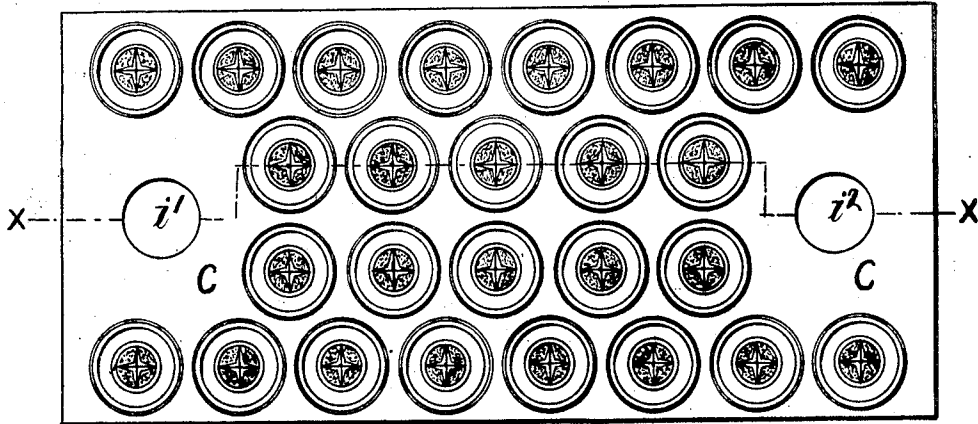


Fig. 2.



Fig. 3.

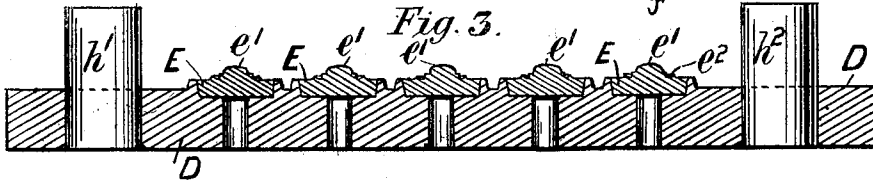
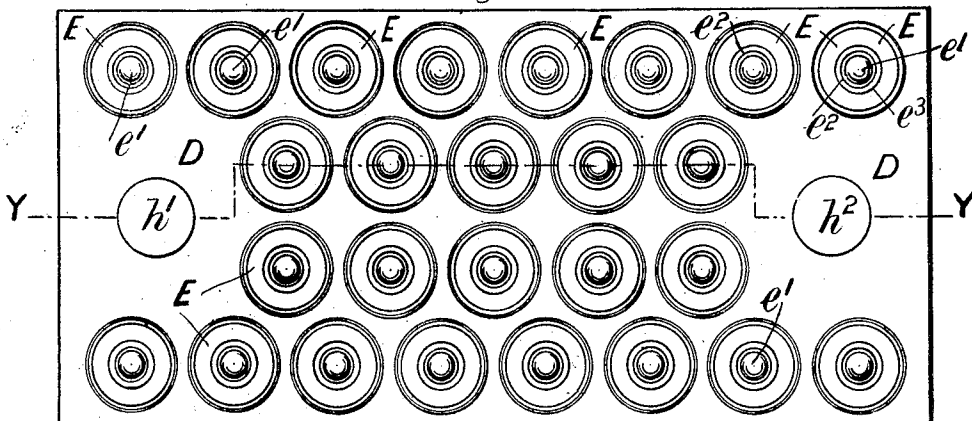


Fig. 4.



Witnesses
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No. 827,799.

PATENTED AUG. 7, 1906.

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3 SHEETS—SHEET 2.

Fig. 5.

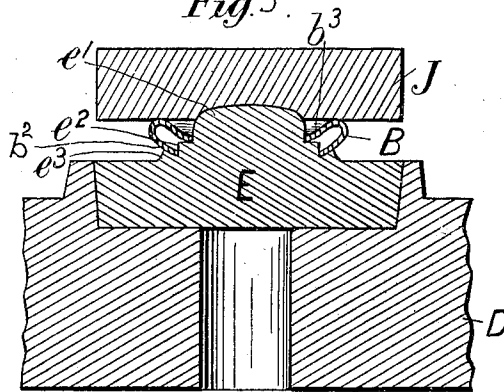


Fig. 6.

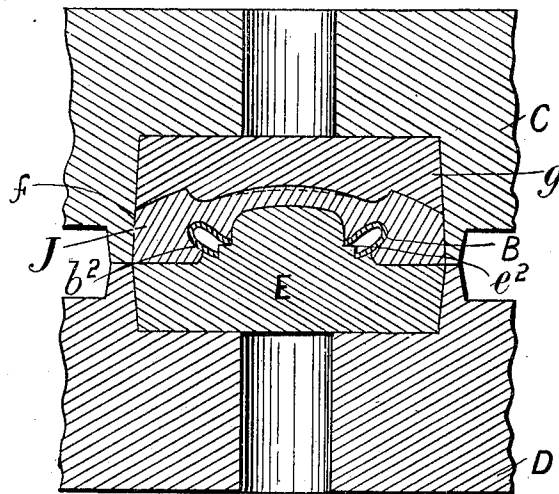


Fig. 7.

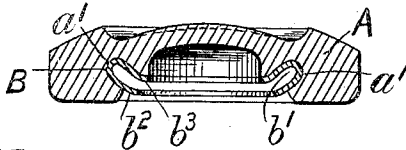
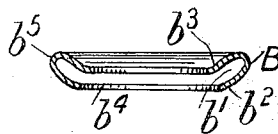


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 7.

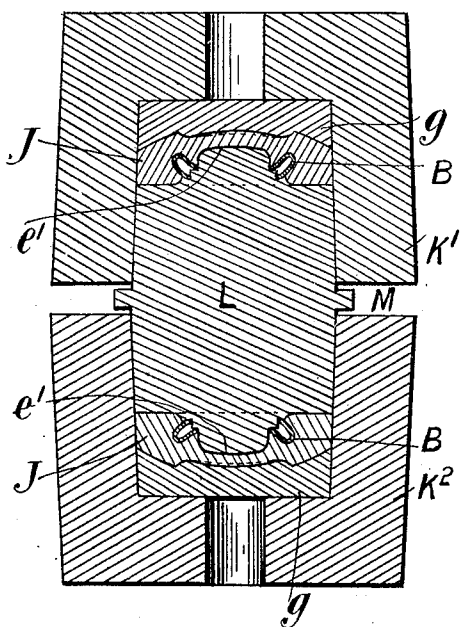


Fig. 10.

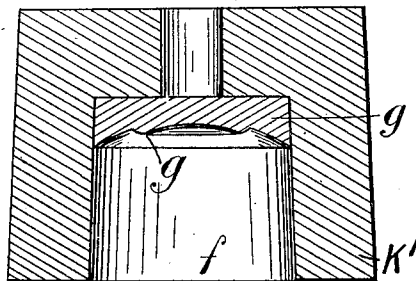


Fig. 11.

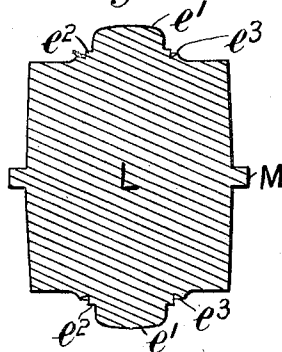
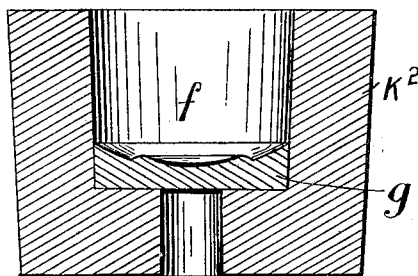


Fig. 12.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE FREDERICK GROVE AND ARTHUR JAMES GROVE, OF HALES-OWEN, ENGLAND.

PRESS-TOOL FOR THE MANUFACTURE OF PUSH-BUTTONS.

No. 827,799.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed June 6, 1905. Serial No. 263,962.

To all whom it may concern:

Be it known that we, GEORGE FREDERICK GROVE and ARTHUR JAMES GROVE, subjects of His Majesty the King of Great Britain and Ireland, residing at Halesowen, in the county of Worcester, England, have invented new and useful Improvements in Press-Tools for the Manufacture of Push-Buttons, of which the following is a specification.

This invention has reference to that class of buttons which are known as "push-buttons" and are used for fastening gloves, leggings, and other articles and have their front parts made of horn, hoof, celluloid, xylonite, glass, china, or other suitable substance other than metal. This front part of the button is in the ordinary way fixed to the fabric of the glove or other article by a flanged eyelet-like part which passes through the hole in the part of the glove or other article and is fixed by the end of the cylindrical eyelet being pushed and bulged outwardly extending into an undercut groove or recess in the back part of the button-front, so that the fabric of the glove or other article to which the button is affixed is gripped between the flange of the eyelet and the back face of the button-front. This eyelet part of the button is the part into which the other or divided spring dome-shaped part of the button snaps when the button is fastened.

In the kind of push-button fronts to which this invention relates there is fixed in the undercut groove or recess a sheet-metal ring having an upwardly and outwardly extending groove so shaped that when the conical ring-like part of the eyelet is forced therein it is by the shape of the groove spread therein and effectually secured thereto.

The press-tools which form the subject of this invention are for the purpose of supporting the grooved metal ring and pressing the substance of the button-front around the same, the said tools being so constructed as to keep the groove in the said metal ring open while the substance of the button-front is being pressed around the same.

Our invention is illustrated by the accompanying drawings, on which—

Figure 1 is an inverted plan of the top tool of a pair of tools which we use for fixing the undercut grooved metal rings to the push-button fronts. Fig. 2 is a sectional elevation of the same top tool on line X of Fig. 1.

Fig. 3 is a sectional elevation of the bottom tool for use with the top tool shown by Figs. 1 and 2. Fig. 4 is a plan of the said bottom tool. Figs. 1, 2, 3, and 4 are drawn full size. Fig. 5 is an enlarged sectional elevation of the bottom tool with the undercut ring in position thereon and with the horn or like blank of the button-front in position on the said sheet-metal ring. Fig. 6 is a sectional elevation of the top and bottom tools, showing how the horn or like blank is compressed around the metal ring while the latter is supported by the bottom tool. Fig. 7 is a sectional elevation of the complete push-button front with the sheet-metal ring embedded therein. Fig. 8 is a sectional elevation of the said sheet-metal ring separately. Fig. 9 is a sectional elevation of a double tool for operating on two button-front blanks and undercut rings simultaneously. Fig. 10 is a sectional elevation of the top tool shown in Fig. 9. Fig. 11 is a sectional elevation of the intermediate tool forming part of the tool shown by Fig. 9, and Fig. 12 is a sectional elevation of the bottom tool shown in Fig. 9.

The same letters of reference indicate the same or corresponding parts in all the figures.

J is the push-button front, made of hoof or horn or other non-metallic substance, and B is the undercut grooved metal ring, which by the tools which form the subject of this invention we compress into the recess *a'* of the button-front while the hoof or other non-metallic front is in a soft or semiplastic state, hereinafter described. The press-tools which we employ are somewhat similar to other tools for compressing horn and like button-fronts, except that our tools are specially constructed, so as to prevent the undercut groove *b'* in the ring B from closing while the plastic horn or like blank for forming the button-front is being compressed in the tools around the ring. The undercut grooved metal ring B is raised from sheet metal and has an annular groove *b'* to receive the end of the conical ring part of the ordinary eyelet, which will be spread and enlarged by the eyelet when the latter is forced therein in the fixing of the button-front to the fabric of the glove or other article with which it is used. It will be seen that the walls of the undercut groove *b'* in the metal ring are formed by the two flanges *b²* *b³*, which incline outwardly from what may be called the "mouth" *b⁴* of

the ring, so that the groove b' is of a gradually-increasing diameter from the mouth b^4 to the larger periphery b^5 , where the flanges b^2 b^3 join together. The said press-tools consist of a top tool C and a bottom tool D. The bottom tool D is a metal plate having fixed in its upper surface a series of upwardly-projecting short dome-shaped pins or dies E, the shape of which will be clearly understood from Figs. 3, 5, and 6. It will be seen that the upper part e' of the dome-shaped pin E is made of the proper size to just pass through the circular hole in the inner flange b^3 of the ring B. The said pin E has a shoulder e^2 , on which this flange b^3 rests, and this shoulder e^2 is made somewhat larger than the diameter of the upper part e' of the pin E, so as to fit into the central hole of the outer flange b^2 of the ring B, which flange b^2 rests upon a circular shoulder e^3 , which is formed on the face of the enlarged part of the pin E and is shaped for the flange b^2 to rest upon. In the top tool C there are circular recesses f , in each of which there is a top die g , corresponding with the shape and the mark or device which is to be impressed on the front of the button. The bottom tool D is made with the usual dowel-pegs h' h^2 , which take into corresponding holes i' i^2 in the top plate C to bring the top and bottom dies or tools properly into register when they are placed together.

The plastic horn or like blanks are formed into the button-fronts and secured and compressed around the rings B by the tools above described in the following manner. When the top tool C has been lifted off the bottom tool D, one of the rings B is placed on each of the pegs E in the manner shown by Fig. 5—that is, with the inner flange b^3 fitting against the upper part e' of the peg E and on the shoulder e^2 of the same and with the outer flange b^2 of the ring B fitting around the shoulder part e^2 of the peg E and on the circular shoulder e^3 of the same. The horn of other suitable button-front blanks J, in a plastic state, each of which is made with a circular recess i' , (see Fig. 5,) are then placed in position on the top of the pins E, so as to cover the metal rings B, as shown in Fig. 5. The top tool C is then placed in position on the bottom tool D, with the dowel-pegs entering the holes i' i^2 , so that the top dies or tools g will now rest on the blanks J. Now the bottom and top tools are placed in the press, which presses the top and bottom tools together, so that the top tools g impress the mark or device on the button front or blank J and compress the substance of the same around the ring B, so that the said substance of the button-front is compressed all around and underneath the ring B, thus effectually securing the button-front and the ring together and giving the button-front the shape shown by Figs. 6 and 7. The shoulder part e^2 of

the upwardly-projecting pegs E, on which the rings B fit, as above described, effectually prevent the undercut grooves b' in the rings from being closed by the pressure. The portion of the outer flange of the undercut ring B which is fixed in the substance of the button-front A being of an enlarged diameter renders it impossible for the ring B to come out of the button-front when the substance of the button-front is pressed over it, as above described.

Instead of employing the series of pegs E, fixed to the plate D, and a series of the dies g on a plate C, as above described, we may use the said pegs and dies singly, as is now done somewhat similarly with other tools for pressing the horn and like buttons; but for our purpose the pegs E have to be made of the special shape above described—that is, with the shoulder e^2 arranged and adapted to keep the undercut grooved metal rings open, as above described, while the plastic substance of the button-front is being pressed around it, as will readily be understood; or we may for this purpose use double tools, as shown by Figs. 9, 10, 11, and 12, which operate on two button-fronts and undercut metal rings B simultaneously. These tools are similar to what are well-known to horn and like button manufacturers, except that the pin parts E, which receive the two undercut grooved metal rings B, are specially formed with the said shoulders e^2 and collar e^3 to keep the grooves b' in the rings B open while they are being compressed, as above described. It will be seen that one set of the double tools comprises two outside tools K' K², which answer to the top tool C, as they are each made with a recess f and a die g to impart the proper device and shape to the front of the button-front, and there is an intermediate double-ended tool L, which is adapted to fit into the recesses f of the outside tools K' K² and at each end is turned with one of the projecting pegs E made with a shoulder e^2 and also with a collar e^3 , as above described, so that, as shown in Fig. 9, two button-fronts with their undercut grooved metal rings B can be operated upon simultaneously. In using these tools shown by Figs. 9, 10, 11, and 12 one of the undercut grooved metal rings B is placed on one of the pegs E on the intermediate tool L in the manner above described and then one of the blanks J is placed on this ring and inclosed by one of the outer parts K' K² being placed over it, and then these are reversed in position and another of the rings B is placed on the other peg E of the tool L and another plastic horn or like button-front is placed on this peg E and ring B and the other outer part K' is placed on this, and now the parts are placed under a press and pressed together, which has the effect of pressing the substance of the button-front around the undercut metal rings

B, as in Fig. 9, the collar part e^3 of the pegs E keeping the undercut metal rings B open, as above described. The tools are then separated and the button-fronts removed. The usual collar M, which is formed round the intermediate tool L and at the center of the same, takes against one or other of the outer tools K' K^2 when the intermediate tool L has entered the same for the proper distance, and thus prevents the intermediate tool L from entering either of the outer tools K' K^2 too far.

What we claim as our invention, and desire to secure by Letters Patent, is—

In tools for fixing an undercut metal ring in a horn or hoof or other non-metallic button-front while in a soft or plastic state, the combination of one tool having one or more pegs E each having a shoulder or collar e^2 adapted for the flanges of the undercut

grooved metal rings to fit around and rest upon, and a recessed die or top tool having the form of the front of the button-front, so arranged that when the horn or other non-metallic button-front blank in a soft state and the undercut metallic ring are compressed between said tools, the groove in the said ring will by the peg be kept open and prevented from collapsing, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE FREDERICK GROVE.
ARTHUR JAMES GROVE.

Witnesses:

CHARLES BOSWORTH KETLEY,
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