

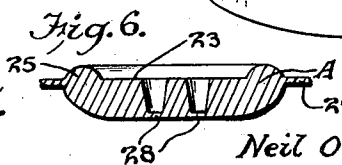
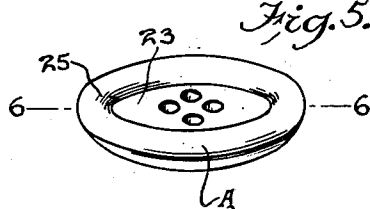
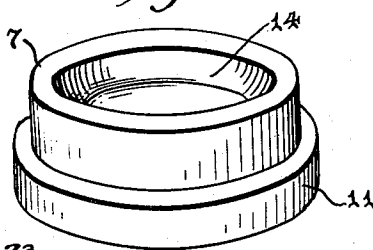
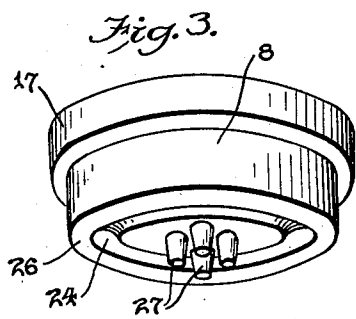
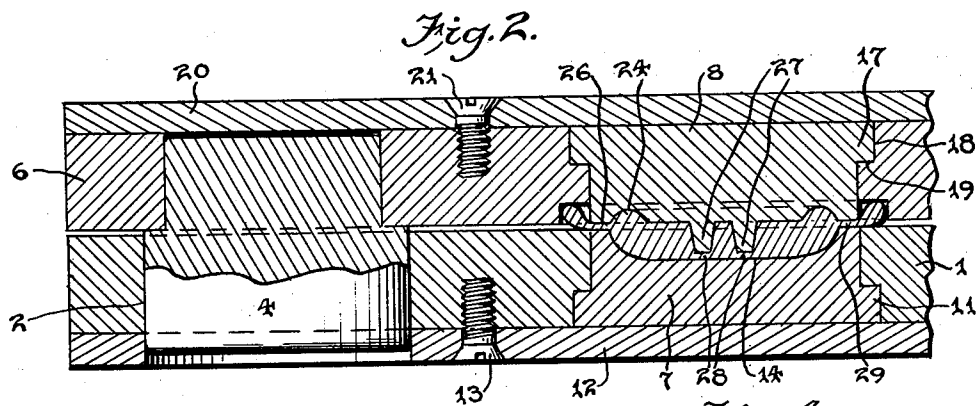
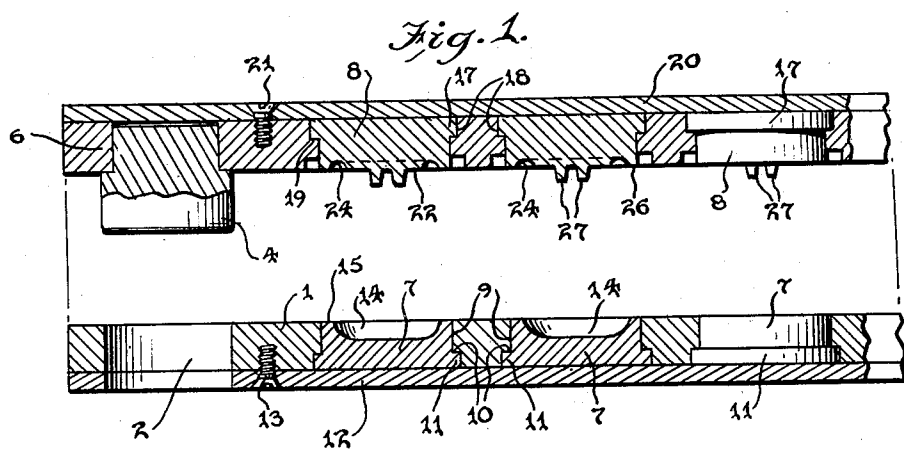
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METHOD OF MAKING BUTTONS

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METHOD OF MAKING BUTTONS

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3 Claims. (Cl. 18—47.5)

This invention relates to a method of making buttons.

In the art of molding buttons, it is the custom to place suitable molding material in a mold between two dies which, when placed together and subjected to heat and pressure causes the material to take the shape of a button.

Buttons have been molded in single molds forming one button at a time, as well as in multiple or gang arrangement of molds or dies, producing hundreds of buttons per molding cycle. It has been, and it is the practice sometimes, to mold buttons without thread holes, in which event special button drilling machine is necessary for the drilling of the holes after the body of the button has been molded. This entails time, labor and expense plus a certain amount of spoilage by way of broken buttons. This method also tends to produce buttons with variations in the size and spread of the drilled thread holes, due to inaccuracies, incident to lack of care on the part of the operator who makes the set-up of the drilling machine and who cares for the sharpening of the drills.

It has also been a customary practice to employ two-part sectional molds and place pins in one section of the die of sufficient length to enter into holes in the opposite die section so that when the dies are closed, the molding material will form around these pins and thereby provide the necessary thread holes for the button. When the die sections are parted and the buttons removed, no additional work is required, such as the drilling necessary in the first mentioned method. The objection to this second method lies in the cost of producing multiple dies of sufficient accuracy whereby all of the pins in the die sections are in perfect alignment, plus the danger that the slightest misalignment of the master plate, will cause the pins to become bent when the die sections are closed under pressure. There is also difficulty in keeping the pin holes free of material and other numerous disadvantages obvious and known to those experienced in the present art.

To overcome the aforesaid disadvantages it has become more or less customary to place pins in both the male and female sections of the button die and so designed and arranged that when the die sections are closed the ends of these pins will abut or coincide in the middle of the mold to provide for the formation of the hole or holes in the finished button. Experience has taught those skilled in the art that this method is not entirely satisfactory for the reason that even though the individual die sections are in perfect

alignment at the beginning of operations slight distortions of the master or holder plate or due to wear on the guide pins between the master or holder plate and bed plate will throw these guide pins out of alignment and result in the production of a button provided with a hole having an intermediate off-set in it.

It is well known in the present art that button dies must be polished occasionally, which causes the thread hole pins of the male die to become slightly worn, and even without wear, a slight film of material from which the buttons are made is left in the center of the thread hole where the thread hole pins are supposed to come together. This film must be entirely removed by a specially constructed punch or reaming tool or else there will result a knife-like edge or projection within the thread hole which will cut the thread and cause the button to become detached from the garment long before it would if the button were produced with thread holes smooth throughout their entire lengths.

The usual method of polishing and smoothing of the molded button is practiced through the instrumentality of a tumbling action, but this tumbling action is of no avail in removing the fin in the thread hole between the faces of the button because of its protected position mid-way between the ends of the thread holes where the materials in the tumbling apparatus cannot do effective work.

It is therefore the main purpose of my invention to eliminate the above mentioned difficulties, including the elimination of drilling, the necessity of adjustments for perfect radial alignment of male and female dies, elimination of crooked or off-set thread holes, elimination of punching or reaming of the thread holes, and thereby save time, labor and expense in the production of a button having thread holes that are smooth throughout their lengths, obviating undue wear on or cut of the thread which binds the button to the garment.

Another object of the invention resides in a method of producing a button of plastic material by compressing the material between cooperating dies to simultaneously shape the button and provide the same with one or more smooth thread holes having fragile films of the material arranged at the rear ends of the thread holes and which films may be readily removed when desired to render said thread holes open ended and smooth throughout their lengths.

With the above and other objects in view the invention is carried out in the use of a construc-

tion and novel combination and arrangement of parts designed from a standpoint of economy and effectiveness, as will be hereinafter fully described, illustrated in the accompanying drawing, and set forth in the claims hereto appended, it being understood that various changes in the method and in the form, proportion, size and minor details of construction of the die mechanism may be resorted to within the scope of the claims without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawing:

Fig. 1 is a fragmentary sectional view, illustrating a bed plate and a master plate separated, ready to be positioned together over the mold die sections.

Fig. 2 is a fragmentary sectional view of the said plates and the die sections assembled with material therein.

Fig. 3 is a perspective view of one of the male dies.

Fig. 4 is a perspective view of one of the female dies.

Fig. 5 is a perspective view of one of the buttons in its finished condition.

Fig. 6 is an enlarged transverse sectional view illustrating a molded button taken from the mold and in a condition prior to subjection to a finishing operation.

In order that my improved method may be more fully understood, I now make reference particularly to the accompanying drawing, in which one form of molding means is illustrated, and in which the reference character 1 indicates a bed plate having apertures 2 and 3 therein to receive guide pins 4 and 5, respectively, of a master plate 6 for the purpose of properly aligning the button mold dies composed of sections 7 and 8 carried by said plates.

The bed plate 1 is provided with any number of suitable circular openings 9 to removably but snugly receive the female die sections 7. These openings 9 are each enlarged in diameter at their lower portions, as shown, to provide an annular shoulder 10. Each female die section 7 is circular in cross section and has a larger outer cross sectional diameter at its outer end to provide an external annular shoulder 11 to snugly engage the aforesaid annular shoulder 10 surrounding the openings 9 in the bed plate.

The female die sections are inserted in the openings 9 through the bottom of the bed plate and held in proper position therein by means of a backing plate 12 secured to the underside of the bed plate by means of suitable removable fastenings 13.

Each female die section 7 is concaved on its inner face, as indicated at 14, resulting in an annular shoulder 15, and the bottom of the concavity may be slightly curved or substantially flat, as desired, depending upon the form of button to be molded. The form of button to be molded is not important here, and therefore, the shape of the concaved portion or depression in the inner face of each female die section is unimportant, further than to note that the bottom of the concaved portion may be formed as stated or otherwise.

The male die sections 8 are preferably of circular formation in cross section, each having a larger outer diameter than the inner portion thereof to provide an exterior annular shoulder 17. These male die sections are mounted in circular openings 18 in the master plate 6. The

openings 18 in the master plate are the same in form as the openings 9 in the bed plate, including an annular shoulder 19 with which the annular shoulder 17 of the respective male die section is seated and held by means of a backing plate 20 which latter is secured to the back of the master plate 6 in any suitable manner, as for instance, the removable fastenings 21.

By virtue of the removable fastenings 13 and 21 for the backing plates 12 and 20, respectively, the die sections may be readily positioned and removed as desired and the die sections effectively held in their respective openings or seats when positioned for the molding of the buttons.

Each male die section 8 has an inner flat or otherwise shaped central surface 22 for the formation of the front central depressed face surface 23 of the formed button A, and this central surface 22 of each male die section is surrounded by an annular groove 24 arranged within the periphery of said die section to provide for the usual surrounding peripheral button bead 25 which projects from the outer face of the finished button. The inner face of each male die section has an annular shoulder 26 adapted to cooperate with the aforesaid annular shoulder 15 on the respective female die section 7.

One or more thread hole forming pins 27, four in number, as illustrated, project from the aforesaid central face portion 22 of each male die section. These pins may be of uniform cross sectional diameter throughout their lengths and all of the same length but they are preferably tapered toward their outer ends to facilitate separation of the die sections by easy and ready withdrawal of the pins from the molded buttons. These hole forming pins 27 are preferably arranged in equi-distant relation about the center of the aforesaid central face portion 22.

In carrying out the present process or method of making molded buttons, suitable material, that is, material preformed in pellets, is placed on the female dies according to the number of dies employed, and the master plate, carrying the male dies, is placed over the bed plate 1 with the guide pins 4 and 5 entering the guide holes 2 and 3 of the bed plate which results in an alignment of the respective male and female dies; and the die sections thus aligned between said plates, together with said plates, are placed in a suitable press commonly used for such purposes and the necessary pressure applied to provide for the formation of the buttons A between the die sections. The particular character of press employed is immaterial in so far as the invention or method here is concerned and illustration thereof is unnecessary. The dies may be fastened to the press. Suffice it to say that the die sections are aligned, preferably between a bed plate and a master plate, and subjected to necessary pressure. This pressure results in the thread hole forming pins being forced to meet or abut with and rest upon the inner faces of the respective female die sections as the shoulders 15 and 26 of the die sections cooperate and an exceedingly thin film 28 is pressed against the smooth face of the respective female die at the minor end of the tapered thread holes. This film 28 is so thin as to be readily breakable. The film 28 is in effect forced or impinged against the face of the female die section by the outer ends of said pins and these films lie in the plane of the back of the button and do not project beyond the outer surface of the back of the formed button. The films 28 are prevented from becoming located at any other place

han at the very extreme outer or minor ends of the tapered thread holes by the tapered hole forming pins and the die sections and from which location the films may be readily broken away and removed by tumbling of the molded buttons in a barrel containing metal or other objects and impact of the metal or other objects exterior of and with the buttons break the films away quickly from the buttons. The tumbling objects, if small enough, might enter the thread holes and clog them. Therefore, as the thread holes are not rough but smooth incident to the smooth hole forming pins, I preferably employ tumbling elements of a size too large to enter the thread holes, and if it be desired to give additional smoothness to the holes where the films have been broken away, the buttons may be barrel tumbled, and polished in the conventional way. Thus it is not necessary that the tumbling elements be of a size to pass through the thread holes either to break away the film 28 or to polish the button for the reason that the film 28 is so located that the tumbling elements may engage the film exteriorly of the button to effectively break or wear the same away and when the film is removed, the point of removal being at the extremity of the minor end of the tapered thread hole, the surface of the button at such end may be readily smoothed by contact therewith of the tumbling elements operating exteriorly of the buttons and buttons produced having thread holes free of internal roughness liable to cut the button sewing thread. Any flash which is formed on the edge of the button between the shoulders 15 and 26 of the respective female and male dies is broken away and the buttons smoothed at the edge of the buttons during the tumbling operations.

If the preformed pellets or any of them contain more than the necessary amount of material such over amount or flash will pass between the male and female dies into the respective annular grooves 16 of the master plate 6 as the dies are pressed together, these grooves 16, as shown, surrounding the respective master plate die receiving openings 18 and communicating with the latter to receive any surplus material forced from between the dies.

It should now be apparent that the male and female dies are constructed so that the hole forming pins 27 of one die section rest at their outer ends upon the face of the corresponding opposite die section when the empty die is closed, and that the shoulders 15 and 26 of the die sections rest upon one another. When the mold is supplied with the button material and the dies are assembled and the assembled dies are subjected to pressure, the material is compressed between the respective dies and the presence of small films at the inner or minor ends of the pins 27 will cause a corresponding separation of the shoulders 15 and 26 of the respective die sections to a degree equal to the thickness of the film or films.

In other words, a fin is produced at the ends of the pins which will be of exactly the same thickness at any given moment as the fin or flash 29 between the shoulders. As the die is closed and

the excess material squeezes out between the shoulders, an equilibrium is finally reached at which no more material overflows. Even under full pressure the flash will still remain of measurable thickness and the fin at the end of the pins 5 will have this same thickness.

This spacing of the shoulders 15 and 26 insures the passage of surplus material or flash 29 to pass between the respective die sections to the respective recesses 16 and if any of the flash remains on the edge of the formed button it may be readily removed by a tumbling or other operation as previously stated.

It will also be readily apparent that the use of reaming, punching and drilling devices or the 15 formation of crooked or off-set thread holes is obviated and that, therefore, the buttons molded under the present process are not as apt to become detached from a garment as when the threads cut or tear as the result of sharp edges 20 or rough places in the thread holes of buttons as sometimes made.

What is claimed is:

1. A method of producing buttons having a plurality of holes, consisting in forming a button 25 of plastic material in a sectional mold provided on one of its sections with a plurality of tapered thread hole forming pins of a length to extend substantially through the molded button and into substantially abutting relation with a concaved 30 surface on the other mold section to form thin films of plastic material on the button at the minor ends of the holes at the back of the button, removing the button from the mold, and then removing the said films by a tumbling action 35 against the exterior surface of the button.

2. A method of producing buttons having a plurality of thread holes, which consists in forming a button of plastic material in a sectional mold having a smooth and unobstructed substantially concaved surface on the inner face of one of its sections and provided on the inner face of its other section with a plurality of thread hole forming pins of a length to extend through the molded material and impinge exceedingly thin 45 films of the plastic material against the said smooth surface of the first mentioned section and thereby expose said films at the extreme rear ends of said thread holes, removing the molded button from the mold, and then tumbling the button 50 thus molded in the presence of articles of substantial weight to remove the films.

3. The herein described method of making a molded button which consists in compressing the material between cooperating dies to simultaneously shape the button and provide the same 55 with tapered thread holes provided with thin films of the material at the minor ends of the tapered holes, removing the buttons thus formed from between the dies, and then removing the films 60 from the minor ends of the tapered holes and smoothing the edges around said ends of the holes by a tumbling of objects against the exterior surface of the button.

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