

[54] **APPARATUS FOR MAKING A DISPLAY BUTTON**

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[22] Filed: **Aug. 24, 1970**

[21] Appl. No.: **66,210**

[52] U.S. Cl.29/238, 29/452, 72/462, 79/18

[51] Int. Cl.**B23p 19/04**

[58] Field of Search ..29/452, 238, 200, 446; 72/462; 79/18

[56] **References Cited**

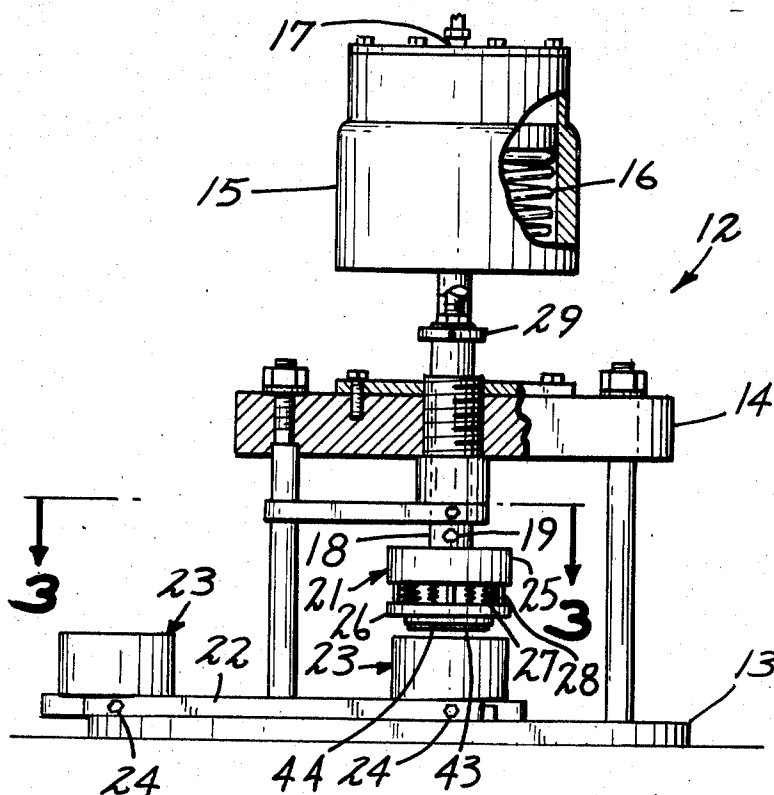
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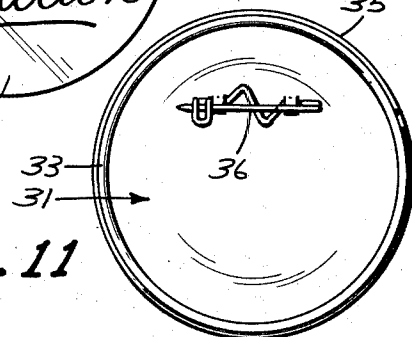
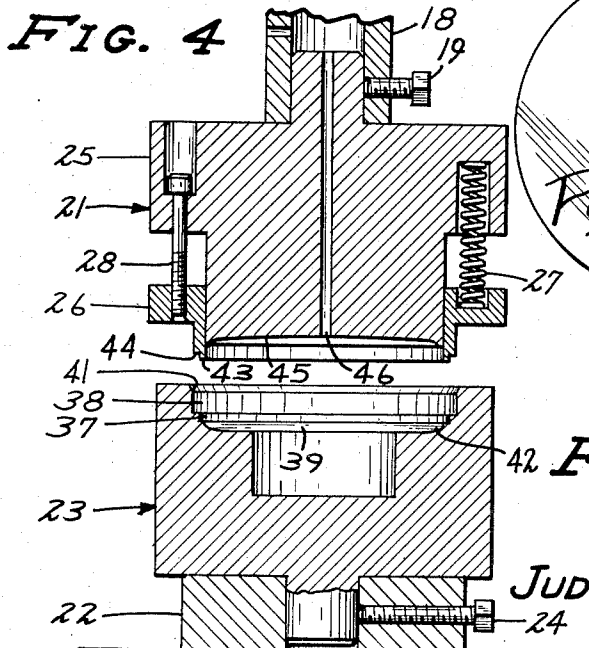
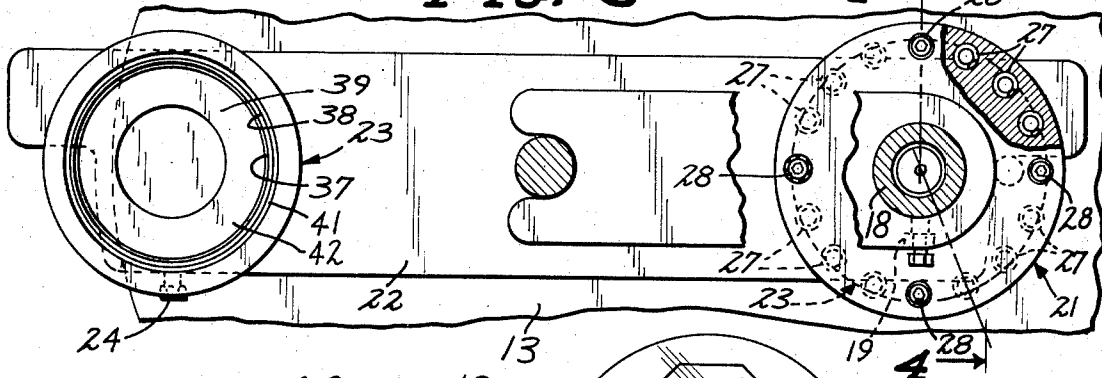
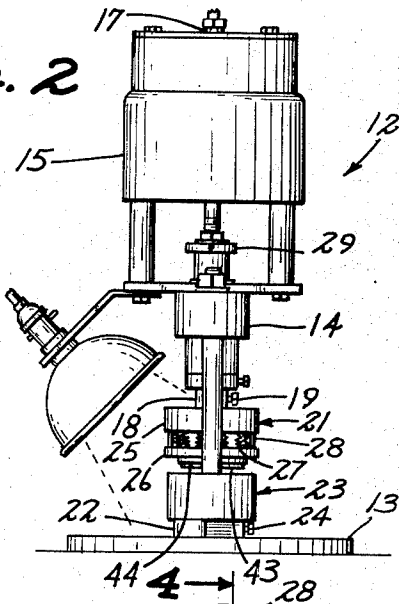
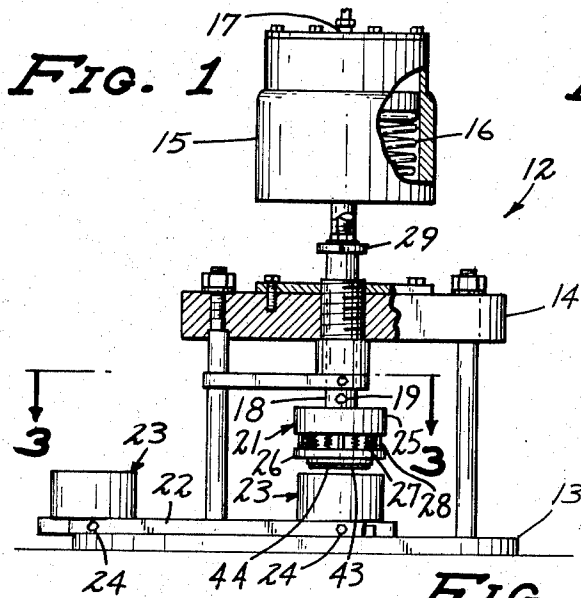
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[57] **ABSTRACT**

Apparatus for the manufacture of a laminated button comprising a metallic backing plate having a transverse peripheral edge and an outwardly extending flange, an illustrated paper sheet and a protective acetate covering. The apparatus comprises a pneumatically operated press which receives the plate, illustrated sheet and covering, and, with a single downward movement, causes the sheet to conform to the plate and be crimped between the transverse edge and flange.

10 Claims, 11 Drawing Figures





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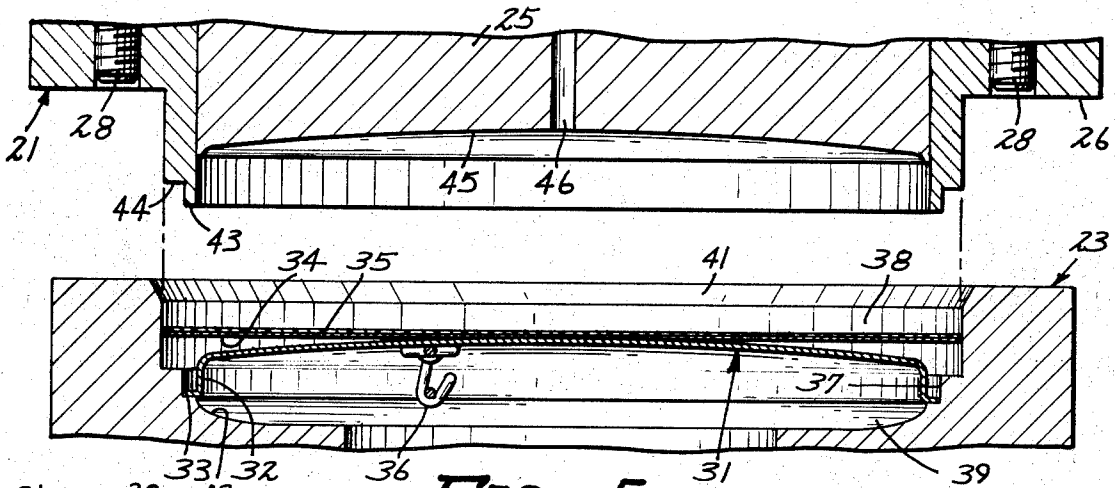


Fig. 5

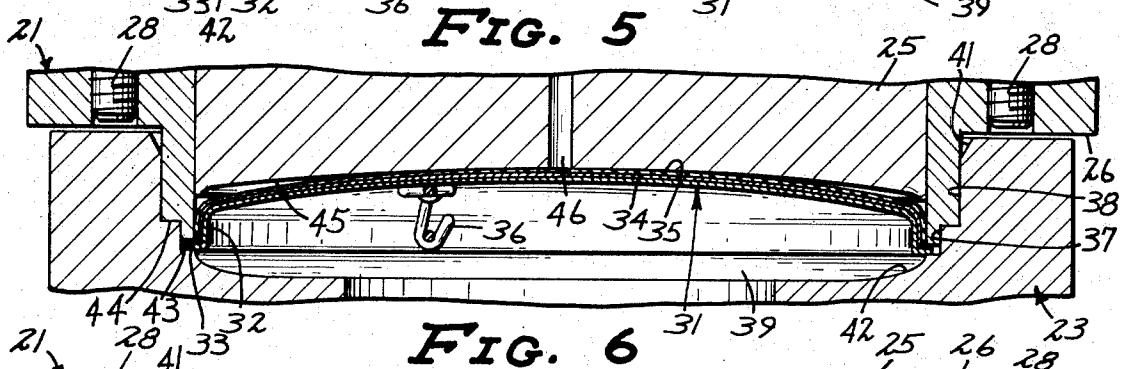


Fig. 6

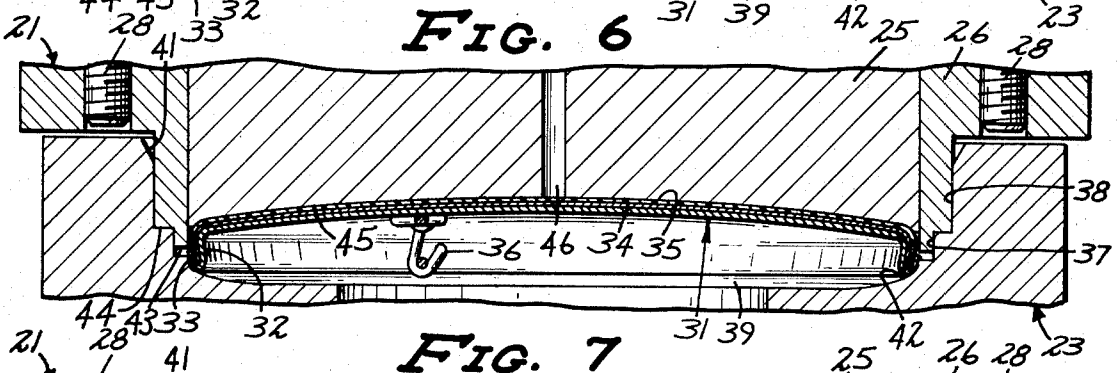


Fig. 7

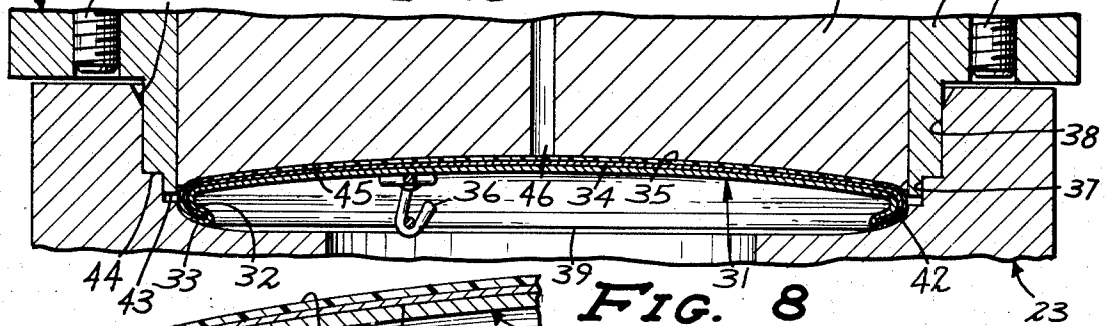


Fig. 8

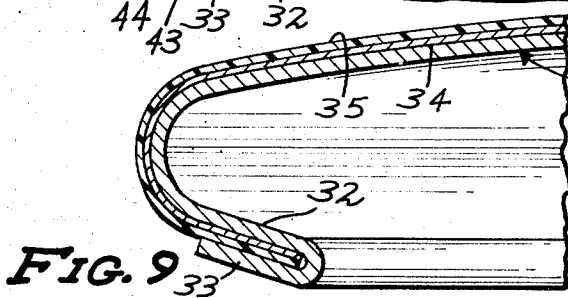


Fig. 9

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APPARATUS FOR MAKING A DISPLAY BUTTON

The invention is directed to apparatus for and the method of manufacturing laminated display buttons.

Laminated display buttons comprising one or more metallic backing plates, an illustrated paper sheet and a protective acetate covering have long been desirable items for use in political campaigns, advertising, sponsorship of athletic teams, promotion of events and the like. The most conventional structure of such display buttons has consisted of a first dome-shaped metallic plate over which the paper and acetate are formed, and a second metallic backing plate which fits inside the first plate and together therewith crimps the peripheral edges of the paper and acetate in a retaining position.

The apparatus used in the manufacture of double plate display buttons has consisted of a press, usually pneumatic, which employs a three piece die set. One of the dies is disposed in the axially movable mechanism of the press, whereas the remaining dies are respectively disposed in the extreme ends of a pivoting arm which permits either die to be rotated into axial alignment with the first die. Initially, the acetate covering, the paper sheet and the dome-shaped backing plate are placed into one of the rotatable dies, after which the first die is lowered by the press to pick up the components. The second backing plate is then placed into the remaining rotatable die, and after proper alignment with the first die the press is operated to bring the two together and form the finished display button.

More recently, it has become the practice to manufacture laminated display buttons with a single metallic backing plate. However, the apparatus and method of manufacture of these has not varied significantly. All three components are initially placed into one of the rotatable dies which, after movement to the alignment position, transfers the components to the first die upon operation of the press. The remaining die is thereafter rotated into alignment position, and subsequent operation of the press performs the crimping step to complete the manufacturing process.

The apparatus and method used in the manufacture of this display button having a single backing plate offer advantages over manufacture of the double plate button by virtue of the material saving. However, under given economic conditions I have found that far more significant savings can be effected by reducing labor costs rather than minimizing the cost of materials. My invention is the result of an endeavor to make such an improvement, and permits laminated display buttons to be manufactured in but a single step. Although the labor saving costs are small per button manufactured, the savings are considerable when large quantities of buttons are manufactured.

The backing plate employed by my inventive apparatus and method comprises a dome-shaped plate having a transverse peripheral edge from which a flange radially extends. The die set includes only two dies, one of which receives and holds the acetate, paper sheet and backing plate. The upper die includes relatively movable parts which initially cause the acetate and paper to conform to the outer surface of the backing plate downward movement. Further movement causes the transverse peripheral edge to be forced radially inward at which point the flange is forced into a recess having a rounded shoulder portion of decreasing radial size. This causes the flange to bend toward the

transverse edge and results in the acetate and paper being crimped therebetween to form the finished product.

The inventive apparatus and method thus reduce the number of manufacturing steps from two to one, which also doubles the output of a particular machine.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of a display button manufacturing press which incorporates the inventive principle;

FIG. 2 is a front elevation of the button making press;

FIG. 3 is a top sectional view of the button making press, showing with particularity a rotatable arm the outer ends of which carry like dies taken along the line 3—3 of FIG. 1 part thereof being broken away;

FIG. 4 is a sectional view of an inventive die set used in the button making press taken generally along the line 4—4 of FIG. 3, part thereof being broken away;

FIGS. 5—8 are enlarged fragmentary sectional views of the die sets of FIG. 4 illustrating the sequential positions thereof during manufacture of a display button;

FIG. 9 is an enlarged fragmentary sectional view of a finished display button, showing with particularity the crimped edge thereof;

FIG. 10 is a front view of a finished button; and

FIG. 11 is a rear view of a finished button.

FIGS. 1 and 2 disclose a conventional pneumatic press 12 for manufacturing laminated display buttons. Press 12 includes a base 13 which carries an elevated support 14 as shown. Mounted on elevated support 14 is a piston-cylinder arrangement 15 which is normally biased to an upward position by a spring 16 and includes an inlet 17 which is adapted for connection to a source of air pressure. An actuating rod 18 is operatively connected to piston-cylinder 15 for reciprocating movement, and, as best seen in FIG. 4, its lower end is tubular in shape and includes a set screw 19 for receiving and holding the upper die 21 of a die set.

Pivotaly mounted on one of the legs of elevated support 14 is a rotatable arm 22 the extremities of which carry identical dies 23 (FIG. 3). As best seen in FIG. 4, pivot arm 22 includes a receptacle and set screw 24 for retaining die 23 in its proper position. Arm 22 is freely rotatable, but includes detent structure (not shown) which cooperates with base 13 to retain either of the dies 23 in a position of axial alignment with die 21.

As shown in FIG. 4, die 21 comprises an upper member 25 and a lower member 26 which are telescopically movable along an axis of operation. Members 25 and 26 are normally biased apart by a plurality of springs 27, the outer most position being defined by the heads of a plurality of adjusting bolts 28 (see also FIG. 3).

In operation, a pulse of air pressure admitted to piston-cylinder 15 through air inlet 17 causes actuating rod 18 to move axially downward until the lower member 26 of die 21 abuts die 23. Further downward movement of actuating rod 18 permits the upper member 25 of die 21 to move axially downward until an adjustable collar 29 mounted thereon abuts elevated support 14.

Referring to FIG. 5, the laminated display button to be manufactured is shown to initially comprise a circular backing plate 31 which is generally dome-shaped

and includes a transverse peripheral edge 32 with a flange 33 extending radially outward therefrom. Plate 31 is formed from a ductile material, preferably metal. The display button also comprises an illustrated sheet 34 made of paper or a similar material and a protective covering 35 which is normally made of acetate. A pin 36 (see also FIG. 11) is suitably attached to the rear side of backing plate 31 to enable it to be pinned to fabric.

Lower die 23 includes 3 recesses 37, 38, 39, all of which are circular to conform to the shape of the laminated button. However, the recesses are of different size and extend to varying depths within die 23 to perform the desired button forming function, as described below.

Recess 37 conforms generally to the size of backing plate 31, having a circumference slightly larger than flange 33 which permits the recess to receive plate 31. Recess 38 extends to a lesser depth than recess 37, but has a greater diameter which permits it to receive both the illustrated paper sheet 34 and acetate covering 35 in an overlying position with respect to plate 31. Recess 38 may include a chamfered edged 41 to insure the proper entry of lower member 26 of die 21.

Recess 39 extends to the greatest depth in die 23 and is of the smallest size. Its diameter is chosen to be less than that of flange 33, but more than the diameter of the circle defined by the edge joining flange 33 and the transverse peripheral edge 32. Recess 39 is formed with a rounded shoulder portion 42 immediately adjacent the point at which its diameter is a maximum.

Lower member 26 of die 21 comprises a projecting rim 43 into which a stepped surface 44 is formed. Rim 43 is sized to fit within recess 37. As best seen in FIGS. 6-8, surface 44 is arranged to engage and abut the lower surface defining recess 38, thereby serving as a limit stop between lower member 26 and lower die 23 and preventing rim 43 from reaching the flange 33.

The exposed surface of upper member 25 of die 21 has a concave recess, as shown at 45, and is of essentially the same size as recess 39. A passage 46 (see also FIG. 4) establishes communication between recess 45 and atmosphere.

The procedure for manufacturing a display button is begun with placement of a backing plate 31 into recess 37 with flange 33 resting flush on the lower most surface thereof. An illustrated circular paper sheet 34 and acetate covering 35 are thereafter placed in recess 38, overlying backing plate 31 as shown in FIG. 5.

Actuation of pneumatic press 12 brings upper die 21 downwardly with respect to lower die 23 until surface 44 abuts the lower most surface of recess 38. This causes sheet 34 and protective covering 35 to engage and conform to plate 31. As shown in FIG. 6, the inside diameter of projecting rim 43 is slightly less than the outside diameter of transverse edge 32 and the thickness of sheet 34 and covering 35. Accordingly, as rim 43 moves downward it forces transverse edge 32 and flange 33 radially or laterally inward, causing backing plate 31 to bow slightly. Since lower member 26 has reached its lower stop position, further downward movement on the part of upper die 21 is limited to downward movement on the part of upper member 25. Vent 46 permits air to escape as member 25 approaches plate 31.

Because the point at which transverse edge 32 and flange 33 are joined overlies recess 39, this downward movement on the part of upper member 25 drives the joining edge into engagement with shoulder portion 42 of recess 39, as shown in FIG. 6. Flange 33 is simultaneously bent upward, thereby crimping sheet 34 and protective covering 35 against transverse edge 32. As shown in FIG. 7, further downward movement of upper member 25 drives the now assembled peripheral edge further along shoulder portion 42 to complete the process.

FIG. 8 is an enlarged representation of the button in its completed form, showing with particularity the detail of the crimped edge. FIGS. 10 and 11 are full front and rear views of the fully completed button.

What is claimed is:

1. A die set for use in forming a laminated display button from an illustrated flexible sheet and a backing member comprising a plate formed from a ductile material having a transverse peripheral edge and a flange extending outward therefrom;

the first die comprising:

a die member;

a first recess in the die member conforming in size and shape to the flexible sheet;

a second recess in the die member adjacent to the first recess conforming in size and shape to the flange of the backing member;

and a third recess adjacent to and being smaller than the second recess, the third recess having a peripheral shoulder portion;

and the second die comprising:

a first member having a projecting rim constructed and arranged to engage a flexible sheet disposed in the first recess and cause it to conform to a backing member disposed in the second recess;

and a second member constructed and arranged to engage the plate and drive the flange into conforming engagement with the shoulder portion to effect crimping of the flange against the peripheral edge with the flexible sheet therebetween.

2. The die set as defined by claim 1, and further comprising means for effecting movement of the second die with respect to the first die.

3. The die set as defined by claim 1, wherein the projecting rim is constructed and arranged to engage and bend the transverse peripheral edge of the backing member laterally inward before its engagement by the second member.

4. The die set as defined by claim 1, wherein the first and second members further comprise mutually engagable abutting surfaces disposed to prevent the projecting rim from engaging the plate flange.

5. The die set as defined by claim 1, wherein the button forming portions of the first and second dies are circular in shape.

6. The die set as defined by claim 1, wherein the first die further comprises a passage for venting air trapped between the backing member and the second movable member.

7. The die set as defined by claim 1, wherein the laminated button further comprises a transparent protective covering for the illustrated sheet, the die set being constructed and arranged to assemble the protective covering with the illustrated sheet.

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8. The die set as defined by claim 3, wherein the projecting rim has a slightly smaller periphery than the transverse peripheral edge of the backing member and the thickness of the flexible sheet to effect said laterally inward bending upon engagement of the edge by the rim.

9. The die set as defined by claim 2, wherein the first and second dies are aligned on an axis, the first and second members of the second die being concentrically disposed and telescopically movable with respect to each other.

10. Apparatus for forming a laminated display button from an illustrated flexible sheet and a backing member formed from ductile material and comprising a plate

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having a transverse peripheral edge and a flange extending outward therefrom, comprising:

first forming means for holding the plate and flexible sheet in an aligned position, the first forming means further comprising a recess having a peripheral shoulder portion disposed adjacent the flange of the plate;

and second means for causing the flexible sheet to conform to the plate and for driving the flange into the recess into conforming engagement with the shoulder portion to effect crimping of the flange against the peripheral edge with the flexible sheet therebetween.

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