

Feb. 15, 1966

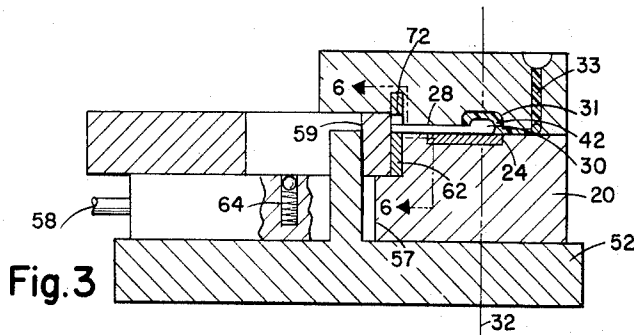
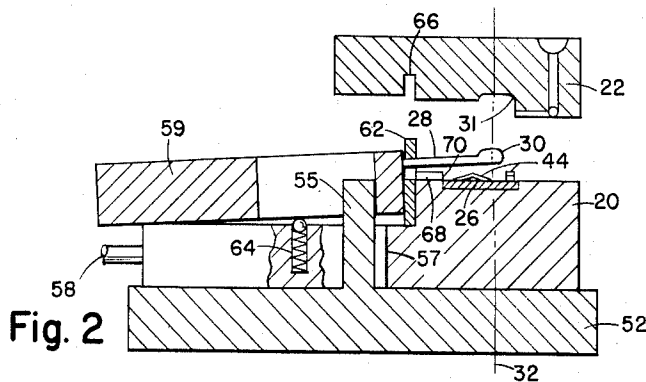
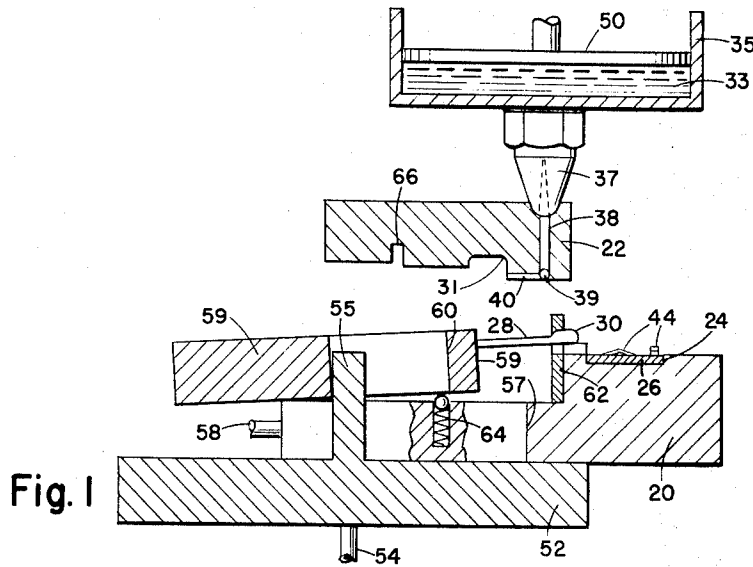
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3,234,756

EARRING CONSTRUCTION

Original Filed Dec. 20, 1961

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

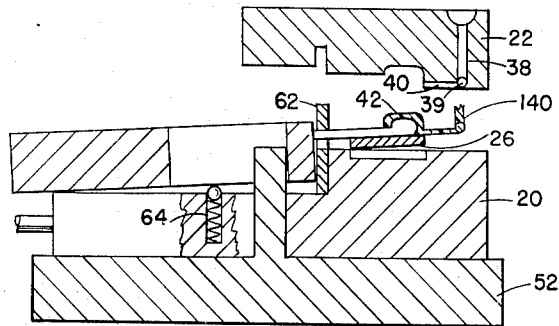


Fig. 4

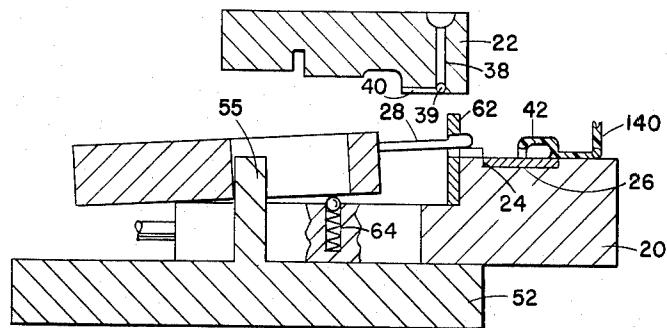


Fig. 5

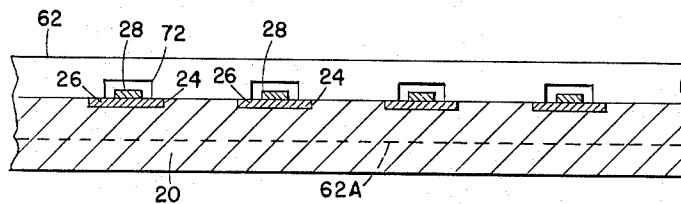


Fig. 6

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3 Sheets-Sheet 3

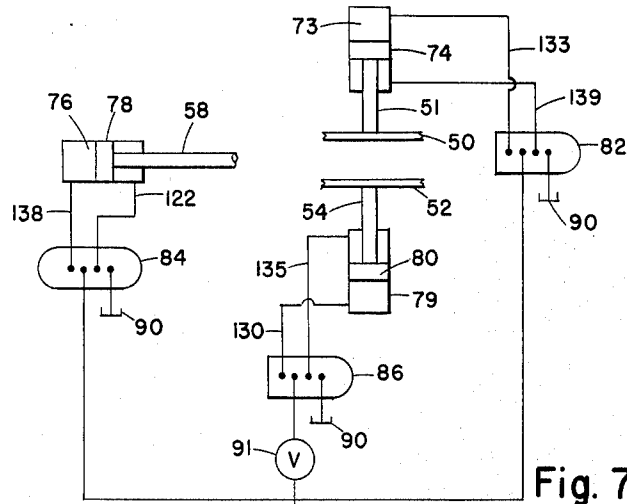


Fig. 7

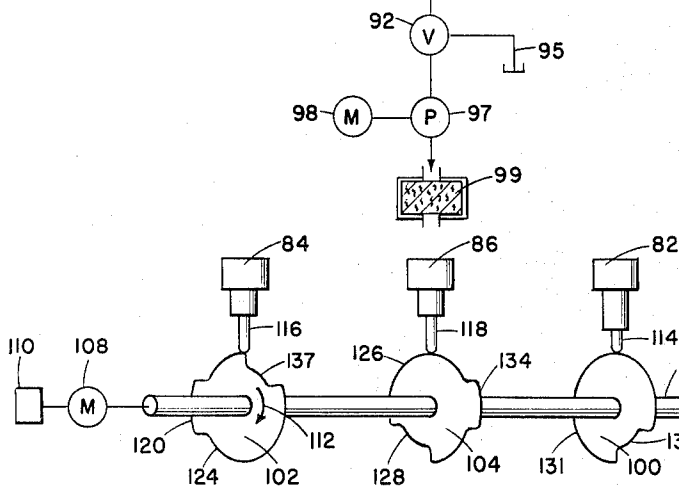


Fig. 8

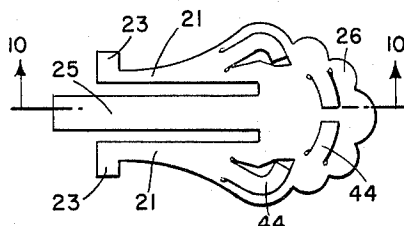


Fig. 9

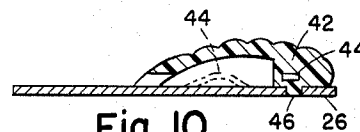


Fig. 10

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3,234,756

EARRING CONSTRUCTION

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Original application Dec. 20, 1961, Ser. No. 160,809.
Divided and this application Nov. 19, 1962, Ser. No. 238,358

4 Claims. (Cl. 63—14)

My invention relates to an earring construction and more specifically to an earring paddle having a hollow resilient pad bonded thereto and method for making the same. This application is a division of my application, Serial No. 160,809, filed December 20, 1961, now abandoned.

In order to overcome the many disadvantages of the old vice type of earring clamp, many innovations have recently developed in the nature of spring actuated clamps for maintaining the earring on the lobe of the ear. This development in earring construction presented inherent disadvantages, the main one of which has been the discomfort resulting to the wearer of the earring. In order to overcome the latter disadvantage, manufacturers have endeavored to attach resilient pads to the spring actuated clamp for engaging the back of the ear lobe and thereby alleviate the intense pressure between the earring and the spring actuated clamp.

Because commercial practicalities demand that earrings of the costume jewelry variety be manufactured inexpensively, it has been extremely difficult to produce satisfactory padded earring paddles or clips. Heretofore, earrings of this construction have been either totally unsatisfactory for lack of proper glue or other adhesive between the pad and the paddle or impractical because of the inordinate expense of manual labor in attaching pads to earring paddles. It was not until my invention that a satisfactory earring paddle or clamp having a resilient pad bonded thereon could be manufactured inexpensively.

My invention has overcome all of the problems involved in manufacturing satisfactory, inexpensive padded earring paddles. I have devised an earring paddle and method for making the same adaptable for mass production whereby a core of selected shape and size corresponding to the interior surface of the pad to be formed overlies a center portion of the paddle and a plastic bubble or pad is molded over the core and onto gripper portions around the periphery of the paddle, and thereafter the core is stripped from the paddle leaving the paddle and attached pad.

One object of my invention is to provide an earring construction for increased comfort to the person adorned thereby.

It is a significant object of my invention to provide a padded earring paddle of the above described nature which is adapted for mass production.

Other objects and advantages of this invention will be particularly set forth in the claims and will be apparent from the following description, when taken in connection with the accompanying drawings, in which:

FIGS. 1-5 inclusive are side sectional schematic views of the illustrated embodiment of my invention shown in various positions during the molding of the hollow plastic pad to the earring paddle;

FIG. 6 is a sectional view with parts broken away taken along the lines 6-6 of FIG. 3, looking in the direction indicated by the arrows;

FIG. 7 is a schematic view of the hydraulic circuitry controlling the embodiment illustrated schematically in FIGS. 1-5 inclusive;

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FIG. 8 is a schematic view of the valve controls for the hydraulic circuitry illustrated in FIG. 7;

FIG. 9 is an enlarged planar view of an earring clamp or paddle to which a hollow plastic pad is adapted to be molded; and

FIG. 10 is a sectional view taken along the lines 10-10 of FIG. 9, looking in the direction indicated by the arrows including the hollow plastic pad molded to the paddle illustrated in FIG. 9.

With reference to FIG. 1, the illustrated embodiment of my invention includes a pair of companion molds, a lower mold 20 and an upper mold 22 vertically or axially spaced from each other. The lower mold 20 is provided with a recess or cavity 24 adapted for receiving and supporting an article or earring paddle 26. I provide a core 28 having a pad forming or bubble forming portion 30 of selected shape and size corresponding to the desired interior surface of the resilient pad or bubble to be molded. Core 28 is adapted to overlie the article or earring paddle 26 in the manner illustrated in FIGS. 2 and 3.

Upper mold 22 is provided with a recess or cavity 31 of a selected shape and size corresponding to the desired configuration of the exterior surface of the pad or bubble to be molded. The cavities 24 and 31 comprise what is referred to in the claims as a "molding cavity." By means to be described hereinafter, the companion molds 20 and 22 and core member 28 are aligned axially along a molding axis 32 extending normal to the "molding cavity" (FIGS. 2 and 3), in which position the cavity 31 overlies the pad or bubble forming portion 30 of core 28.

After the companion molds 20 and 22 and the core 28 are axially aligned, the molds are moved vertically or axially from an open position shown in FIG. 2 to a closed or molding position shown in FIG. 3. In the molding position a void space is provided between the upper mold cavity 31 and bubble forming portion 30 as illustrated in FIG. 3.

When in the molding position illustrated in FIG. 3, liquid polyvinyl chloride, otherwise known as plastisol, 33, being retained in a hopper 35 and ranging in temperature from 350° to 400° F., is hydraulically forced through an injection nozzle 37, a sprue hole 38, a lateral horizontally disposed main runner 39 and a plurality of longitudinal, horizontally disposed runners 40 to a plurality of horizontally spaced voids between a corresponding plurality of horizontally spaced upper mold cavities 31 and the bubble forming portions 30. In this manner, a bubble or pad 42 is molded onto the article or earring paddle 26. The pad or bubble 42 is permitted to solidify. I have used the term "plastic" in the claims to include not only "plastisol" but all moldable resilient matter such as rubber.

With reference to FIG. 9, I have illustrated the preferred arrangement for permanently bonding the resilient pad 42 to the paddle 26 by providing raised gripper portions 44 (FIGS. 1 and 10) partially severed or stamped from the paddle 26 and bent or formed as illustrated in FIGS. 9 and 10. The gripper portions 44 are formed on the inner face such that they extend above and generally along the inner face of the paddle 26 so that the resilient pad 42 may be molded around the shaped portion as illustrated in FIG. 9. This arrangement provides openings in the paddle 26 through which portions 46 of the pad are molded, as shown in section in FIG. 10, for rigidly securing the pad 42 on the paddle 26. Thus, it will be understood that the central area of the pad 42 overlies and is in spaced relationship to the paddle 26. The paddle 26 is adapted to be attached to the earring in a well known manner, for example, the paddle 26 is provided with a pair of clips or tines 21 terminating in

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lateral portions 23 adapted to be rotatably received in coactive portions on the earring (not shown) while a central spring member 25 biases the paddle 26 into engagement with the earring (not shown).

I shall now describe more in detail the illustrated embodiment of my invention, the operation of which is shown sequentially in FIGS. 1-5 inclusive. The illustrated embodiment of my invention is adaptable for use with what is commonly known in the art as a vertical molding machine. The upper mold 22 is rigidly secured to a stationary platen (not shown) of a typical vertical molding machine.

The hopper 35 is rigidly mounted above mold 22 for retaining the liquid plastic 33. The flow of plastic 33 is controlled by hydraulic power transmitted through a connecting rod 51 to a piston 50 mounted in the hopper 35. The lower mold 20 is supported on a movable lower platen 52 actuated by hydraulic power transmitted through a connecting rod 54 in a manner hereinafter described.

Lower platen 52 is provided with a vertically disposed projection 55 being received by a vertically disposed slot 57 of lower mold member 20. Lower mold 20 is horizontally or linearly slidable with relation to lower platen projection 55 by means of hydraulic power, hereinafter described, being transmitted through a connecting rod 58.

Core 28 is rigidly mounted to a core block 59 having a vertically disposed slot 60 receiving the upper end of lower platen projection 55.

I provide a stripper plate 62 rigidly mounted in a vertical position to the left hand face of a shouldered portion of lower mold 20.

The upper mold 22 and the lower platen 52 remain in axially aligned position with respect to the molding axis 32. The lower mold 20 and core block 59 are horizontally or linearly slidable with respect to the molding axis 32 between an aligned position illustrated in FIGS. 2, 3 and 4 and a stripped position shown in FIGS. 1 and 5. As the lower mold 20 is hydraulically moved to the left from the FIG. 1 position to the FIG. 2 position, first the stripper plate 62 engages the right vertical face of core block 59 and, then, the right vertical face of slot 60 engages the right vertical face of projection 55, in which position all parts are axially aligned with respect to the molding axis 32. Thus alignment relative to the molding axis 32 is accomplished by means of the rigid mounting of upper mold 22 and lower platen 52, with projection 55 limiting the sliding motion of lower mold 20 and core block 59 and stripper plate 62 and portion of core block 59 intermediate the right vertical face thereof and the slot 60 providing proper spacing.

One of the significant novel features of my invention is the provision of the resilient biasing means or compression spring loaded ball 64, intermediate lower mold 20 and core block 59, thereby "floating" the core 28 above the paddle 26 as the core block 59 and lower mold 20 are slid from the stripped position of FIG. 1 to the aligned position of FIG. 2. This eliminates any possibility of the core 28 ejecting the paddle 26 during leftward sliding movement. It will be understood that a resilient biasing means could be provided between upper mold 22 and core block 59 in lieu of the one illustrated at 64.

After the parts are axially aligned with respect to molding axis 32 as illustrated in FIG. 2, hydraulic power transmitted to the lower platen 52, through a connecting rod 54, elevates lower platen and all parts carried thereby from an "open" position of FIG. 2 to a "closed" position of FIG. 3, thereby bringing overlying pad forming portion 30 of the core 28 into engaging relationship with paddle 26. The upper mold 22 is provided with a vertically disposed lateral slot 66 adapted to receive the upper end of stripping plate 62 when in the closed position.

Lower mold 20 is provided with longitudinally disposed slots 68, illustrated in longitudinal cross-section in FIGS. 1 and 2. Slots 68 extend through an upwardly projecting portion 70 of lower mold 20 to receive the core 28

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as the lower platen 52 is elevated from the open position of FIG. 2 to the closed position of FIG. 3.

With reference to FIG. 6, the stripper plate 62 is provided with openings or apertures 72 of height sufficient to permit the desired vertical resilient movement of the core 28 and of sufficient width to permit sliding movement of the core between the stripped position of FIG. 1 and the aligned position of FIG. 2. However, the most critical measurement of the opening 72 is that it be not as wide as the paddle 26, thereby permitting the paddle 26 to be stripped from the core 28 as the lower mold is actuated from the aligned position of FIG. 4 to the stripped position of FIG. 5. The bottom edge of the stripper plate 62 is illustrated in broken lines at FIG. 6 at 62-A.

I shall now describe the hydraulic circuitry by which the piston 50, lower mold 20 and lower platen 52 are hydraulically controlled. With reference to FIG. 7, I have provided a simple hydraulic circuit generally, comprising: an injection cylinder 73, housing a hydraulically controlled piston 74 to which connecting rod 51 is attached; a lower mold control cylinder 76 in which is housed a hydraulically controlled piston 78 rigidly connected to connecting rod 53; and a lower platen control cylinder 79 in which is housed a hydraulically controlled piston 80 rigidly connected to connecting rod 58.

Each of the pistons 74, 78 and 80 are hydraulically controlled by the flow of oil from control valves 82, 84 and 86 respectively. These valves admit oil to the selected end of each of the respective cylinders in which the pistons are housed. Each valve is provided with a drain 90. The over-all hydraulic circuit is provided with a pressure control valve 91, a relief valve 92 and accompanying drain 95, a pump 97 controlled by a motor 98 and a filter 99 for filtering the oil recirculating through the pump.

Each of the control valves 82, 84 and 86, as illustrated in FIG. 8, are controlled by cams 100, 102 and 104 respectively. These cams are rigidly mounted on a cam shaft 106 being driven by a motor 103 in turn automatically controlled by a timer 110.

The cam shaft 106 is driven in a clockwise direction as viewed in FIG. 8 and as indicated by the arrow 112. Cams 102 and 104 have a low, intermediate and high portions, whereas cam 100 only has the low and intermediate portions.

Each of the valves 82, 84 and 86, respectively, have plungers 114, 116 and 118 illustrated in their neutral position in FIG. 8, in which position oil does not flow to either side of the pistons controlled thereby. As the cam shaft continues to move counter-clockwise, approximately 60°, plunger 116 rides up on a high cam portion 120 thereby permitting oil to flow through a line 122 to the right hand side of piston 78 thereby sliding lower mold 20 to the left as viewed in FIG. 1 toward the aligned position of FIG. 2.

Upon reaching the aligned position, plunger 116 drops onto the intermediate portion 124 stopping oil flow through valve 84, and plunger 118 of valve 86 drops from its intermediate portion 126 onto a lower cam portion 128, after the cam has rotated approximately 120° from the position illustrated in FIG. 8. Oil is thereby permitted to flow through a line 130 to the lower portion of cylinder 79 forcing piston 80 and lower platen 52 upwardly from the open position of FIG. 2 to the closed position of FIG. 3.

Plunger 118 then rides up on intermediate portion 126, thereby stopping the flow of oil through valve 86, and plunger 114, after the cam shaft has rotated approximately 180° from the FIG. 8 position, drops from an intermediate neutral portion 131 onto a lower portion 132. Oil now flows through a line 133 to the upper portion of cylinder 73 above piston 74 thereby forcing piston 74 and piston 50 downwardly to inject plastic 33 through nozzle 37 and conduit means comprising sprue hole 38,

lateral runner 39 and longitudinal runners 40 into upper mold cavities 31.

Plunger 114 then rides up to the intermediate neutral portion 131 again, at which point the cam shaft has rotated approximately 240° from the position illustrated in FIG. 8, and plunger 118 rides up on a high portion 134 of cam 104, thereby permitting oil to flow through a line 135 to force piston 80 and lower platen 52 downwardly from the closed position shown in FIG. 3 to the open position shown in FIG. 4.

When plunger 118 drops off of the high portion 134 onto the intermediate portion 126 of cam 104, plunger 116 drops onto a lower portion 137 of cam 102, at which time, cam shaft has rotated approximately 300° from the position shown in FIG. 8. Plunger 116 now permits oil to flow through a line 138 to the left hand side of piston 78 thereby sliding lower mold 20 from the aligned position of FIG. 4 to the stripped position of FIG. 5. This completes one entire cycle and the cam shaft will have rotated a full 360° and returned to the position shown in FIG. 8.

While it is not shown, it will be understood that there is a gate, usually provided between the nozzle 137 and sprue line 138 to cut off the flow of plastic from the hopper 35 after the downward movement of piston 50 is stopped. In order to refill the hopper 35 with plastic 33 the piston 50 is elevated, either by manual or solenoid control of the plunger 114 to raise plunger 114 from the neutral position shown in FIG. 8, in order to permit oil to flow through a line 139 below piston 74.

It is obvious from the above detailed description of the apparatus embodying my invention and its function that the process of molding the hollow plastic bubble or pad 42 to the paddle 26 is accomplished in the following manner. Commencing with the initial "stripped" position shown in FIG. 1, the operator manually inserts the paddle 26 into the lower mold cavity 24 while the plungers 114, 116 and 118 ride on the intermediate neutral portions of the respective cams. Thereafter, the lower mold 20 is hydraulically slid leftwardly to the aligned position of FIG. 2 by the apparatus above described. In this position the bubble forming portion 30 of the core 28 overlies a selected central portion of paddle 26.

The hydraulic circuitry above described then elevates the lower platen 52 from the open position of FIG. 2 to the closed position of FIG. 3, thereby bringing the core 28 into engaging relationship with the article 24, in opposition to the biasing means 64, and the upper mold into engaging relationship with the core 28 and the lower mold 20. Thus, all parts arrive at the molding position.

By means of the hydraulic circuitry above described, plastic 33 is forced through nozzle 37 (FIG. 1) into the void area intermediate the upper mold cavity 31 and the pad forming portion 30 of the core 28, thereby forming the pad 42 as illustrated in FIG. 3.

Sufficient molding time is allowed to solidify the pad 42 on the gripper portions 44 formed around the periphery of paddle 26. Thereafter by means of the hydraulic circuitry above described, the lower platen 52 is retracted from the closed position of FIG. 3 to the open position of FIG. 4 and biasing means 64 once again "float" the core 28 as shown in FIG. 4, thereby raising the paddle 26 and attached pad 42.

By means of the above described arrangement of parts, plastic runners 140 (FIGS. 4 and 5) are formed in sprue line 38 and lateral and longitudinal runners 39 and 40 by which all of the plurality of pads 42 are interconnected. The hydraulic circuitry above described then slides the lower mold 20 to the right from the aligned position of FIG. 4 to the stripped position of FIG. 5. The projection 55 limits the sliding motion of the core block 59 and attached core 28 sufficiently less than the permitted sliding stroke of the lower mold 20, as controlled by hy-

draulic cylinder 76 (FIG. 7), permitting the stripping plate 62 to strip the paddle 26 and attached molded pad 42 from the core 28. The paddle 26 and attached pads drop back into the lower mold cavity 24 or at random.

The operator manually breaks each of the plurality of paddles 26 and attached pads 42 away from the plastic runner 140. When the apparatus has reached the position shown in FIG. 5, identical to that shown in FIG. 1, all parts are ready for a new cycle.

While I have shown and described a preferred embodiment of my invention, it will be apparent that various changes and modifications may be made therein, particularly in the form and relation of parts without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. In an earring construction, an improvement comprising:

(a) a paddle having shaped portions formed on the inner face extending above and generally along said inner face; and

(b) a resilient pad molded around and interlocked with said shaped portions, said pad having its central area overlying said paddle and in spaced relation thereto.

2. In an earring construction, an improvement comprising:

(a) a paddle having partially severed raised shaped portions formed on the inner face with corresponding openings in said paddle; and

(b) a resilient pad molded around said shaped portions, said pad having its central area overlying said paddle and in spaced relation thereto.

3. In an earring construction, an improvement comprising,

(a) a paddle having partially severed raised shaped portions formed on the inner face with corresponding openings in said paddle, and

(b) a resilient pad molded onto said shaped portions and into said openings, said pad having its central area overlying said paddle and in spaced relation thereto.

4. In an earring construction, an improvement comprising,

(a) a paddle having partially severed raised shaped portions with corresponding openings in said paddle formed on the inner face along the periphery thereof and an end adapted for attachment to the earring, and

(b) a hollow resilient pad molded onto said shaped portions and into said openings with the hollow of said pad being surrounded by said raised portions, said pad having its central area overlying said paddle and in spaced relation thereto.

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