United States Patent

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[54] **MOLDING DEVICE**
10 Claims, 9 Drawing Figs.

[52] U.S. Cl. 249/170, 249/112: 18/42
[51] Int. Cl. B41b 11/54
[50] Field of Search 249/112, 170; 18/34.1, 42M; 25/122

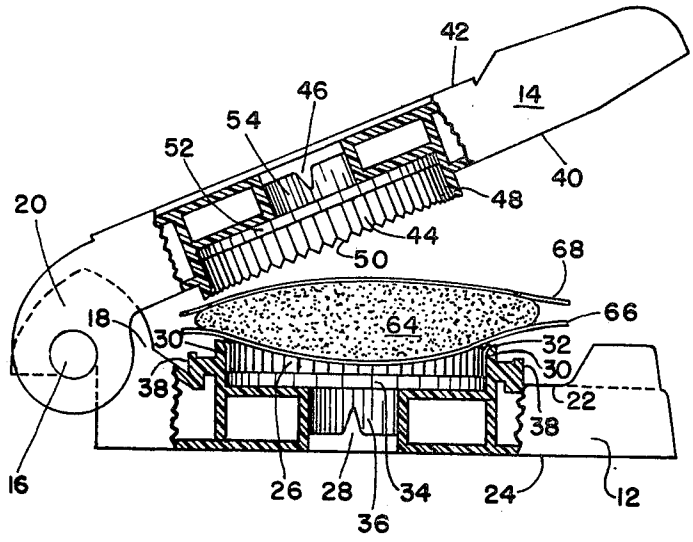
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ABSTRACT: A molding device having a hingedly connected base and cover. The base has an upper face with a recessed portion. An upstanding ridge completely surrounds such recess with a series of teeth along its upper edge. The cover has a lower face with a recessed portion. A closed ridge extends downwardly from the recessed portion and completely surrounds such portion. This downwardly extending ridge has a series of teeth extending completely along its lower edge. The teeth of the downwardly extending ridge and the teeth of the upstanding ridge mesh in cooperative engagement when the cover is closed over the base. When the cover is closed over the base the base and cover teeth are positioned for rolling, folding and cutting the foil of a lamination of foil, malleable material, and foil when a large enough lamination thereof is properly positioned between the teeth. Each recess contains an embossed design which is pressed into the upper and lower foil laminations when the cover is closed on the base.



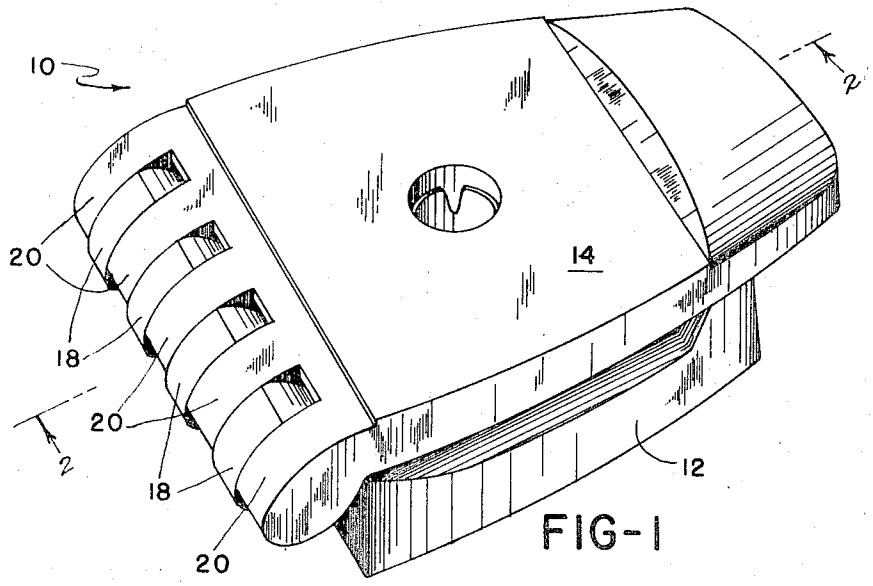


FIG-1

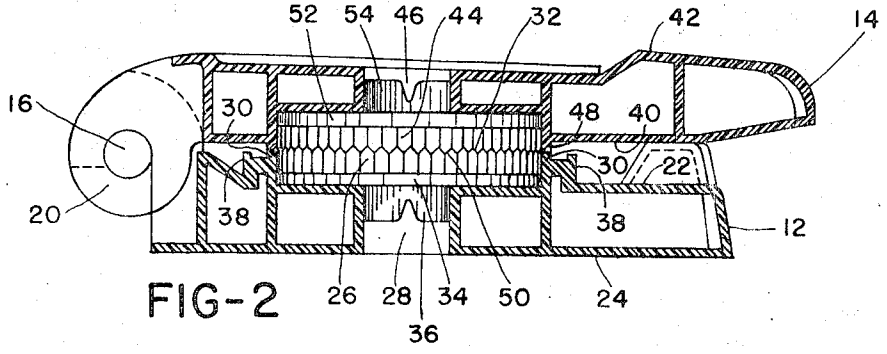


FIG-2

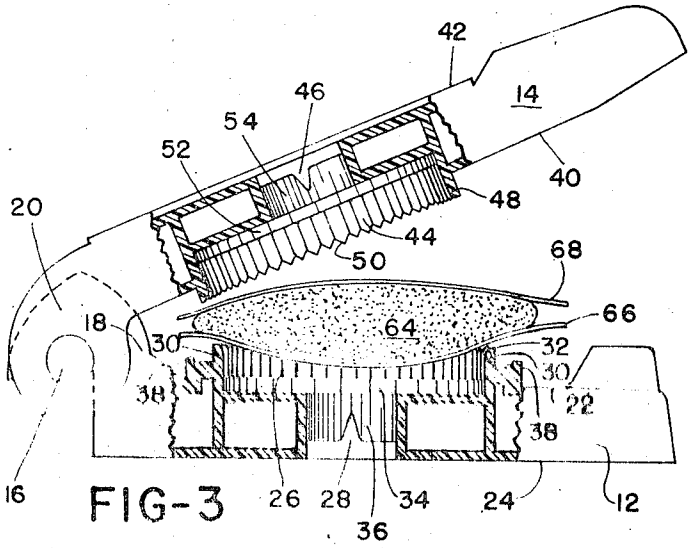


FIG-3

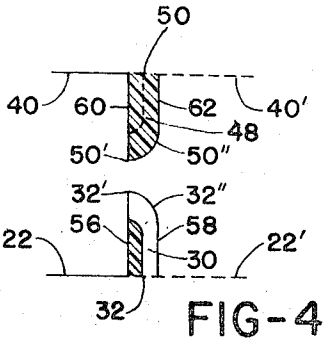


FIG-4

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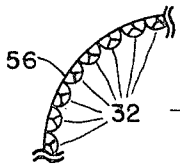


FIG-5

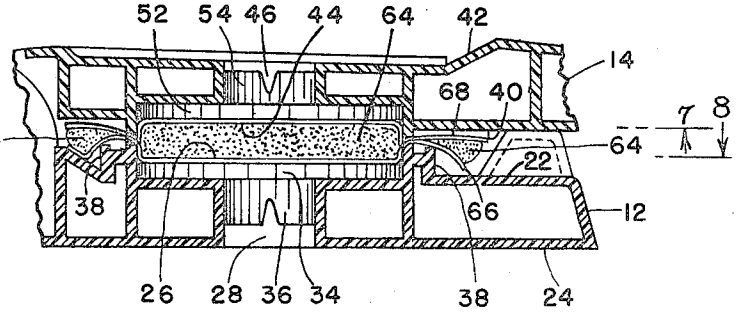


FIG-6



FIG-7

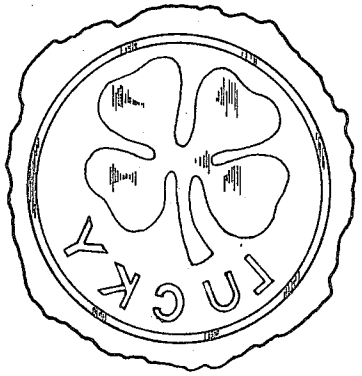


FIG-8

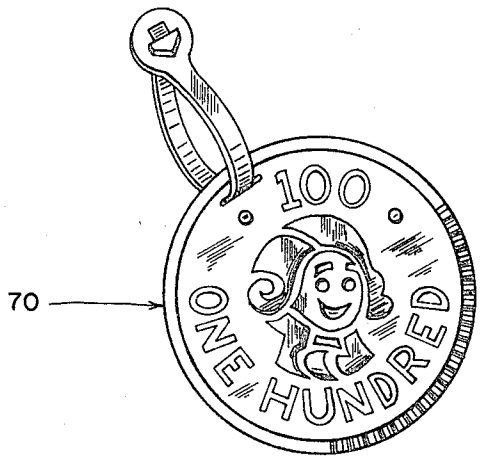


FIG-9

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MOLDING DEVICE

One object of the present invention is to provide a molding device capable of forming a coin, a medallion, a charm or a like product with a foil, malleable material, foil lamination.

Another object of the present invention is to provide a molding device that is inexpensive to manufacture and is sufficiently rugged to withstand the rough handling and abuse to which toys are subjected in the course of play by children.

Other objects and advantages of the invention will be apparent from the following disclosure in which certain preferred embodiments of the invention are disclosed. In the drawings which form a part of this application,

FIG. 1 is a perspective view of a molding device illustrating one form of the present invention,

FIG. 2 is a cross-sectional view taken along lines 2–2 of FIG. 1 looking in the direction of the arrows.

FIG. 3 is a partial cross-sectional view taken along lines 2–2 of FIG. 1 with the cover of the device partially open. In addition, FIG. 3 shows a lamination of foil, malleable material, and foil positioned above a recess in the base of the device,

FIG. 4 is an enlarged cross-sectional view of representative cover and base teeth of the device shown in FIGS. 1, 2 and 3,

FIG. 5 is a partial top view of the base teeth of the device shown in FIG. 2, looking down on the base of the device,

FIG. 6 is a partial cross-sectional view taken along lines 2–2 of FIG. 1 looking in the direction of the arrows when the cover is closed on the base after a foil, malleable material, foil lamination, as shown in FIG. 3, is first positioned as shown in FIG. 3,

FIG. 7 is a partial cross-sectional view taken along lines 7–7 of FIG. 6 looking in the direction of the arrows illustrating an embossed design on a die inserted in the recess of the cover of the device,

FIG. 8 is a partial cross-sectional view taken along lines 8–8 of FIG. 6 looking in the direction of the arrows illustrating another embossed design placed on a die which in this instance was positioned in the recess of the base of the device, and

FIG. 9 is a front view of a molded product formed in the apparatus showing the design impressed thereon by the embossed die illustrated in FIG. 7.

Referring now to FIG. 1, one embodiment of a molding device of the present invention comprises a body 10 having a base 12 and a cover 14. The base 12 and the cover 14 are hingedly attached to each other by means of an elongated shaft 16 which extends through portions 18 of the base 12 and portions 20 of the cover 14. The hinge connection between the base 12 and the cover 14 can be made in any well known manner.

As viewed in FIG. 2, the base 12 has an upper face 22 and a lower face 24. The face 22 has a recess or cavity 26 with an aperture 28. Extending upwardly from the recess 26 is a ridge 30 which completely surrounds such recess. Teeth 32 are positioned along the entire upper edge of the ridge 32.

In the bottom of the recess 26 is an embossed design. This embossed design can be on a removable die 34, as shown, or right in the bottom of the recess 26. The die 34 has a protuberance 36 which extends into and snuggly fits into the aperture 28.

The upper face 22 has another upwardly extending ridge 38. This second ridge 38 completely surrounds the ridge 30. The second ridge 38 is positioned further from the recess 26 than the first ridge 30. The second ridge 38 has the same general configuration as the first ridge 30, i.e., if one is circular the other is circular, if one is square the other is square, if one is rectangular the other is rectangular, etc. The height of the second ridge 38 above the plane of the upper face 22 is equal to approximately one-half of the height of the outside edge of the first ridge 30 above the plane of the upper face 22. The outside edge of the ridge 38 is positioned outwardly from the outside edge of the ridge 30 a distance approximately equal to one-half of the depth of the recess 26, i.e., one-half of the distance from the top of the inside edge of the ridge 30 to the flat surface of the embossed design whether said design is in the die 34, as shown, or in the bottom of the recess 26.

The space between the ridge 38 and the ridge 30 can be either filled, as shown, or open as long as such filling is no further above the plane of the face 22 than the height of the second ridge 38 above the plane of the face 22.

The cover 14 has a lower face 40 and an upper face 42. The lower face 40 has a recess or cavity 44 with an aperture 46. A downwardly closed extending ridge 48 completely surrounds the recess 44. Teeth 50 extend downwardly from the ridge 48 along the entire lower edge of said ridge.

In the recess 44 is an embossed design. This embossed design can be on a removable die 52, as shown, or right in the bottom of the recess 44. The die 52 has a protuberance 54 which extends into and snuggly fits into the aperture 46.

The teeth 32 and the teeth 50 are designed in such a manner so that upon closure of the cover 14 on the base 12 as shown in FIG. 2, the teeth 32 will cooperatively engage the teeth 50. As shown in FIG. 4, for each of the teeth 32 a portion of the outside edge 56 of the ridge 30, i.e., the edge of the ridge 30 furthest from the recess 26, extends further above the plane 22′ of the upper face 22 than a corresponding portion of the inside edge 58 of the ridge 30 does. Thus the outer point 32′ of each of the teeth 32 is further above the plane 22′ of the upper face 22 than the corresponding inner point 32″ of the same tooth of the teeth 32. For each of the teeth 50, a portion of the outside edge 60 of the ridge 48, i.e., the edge of the ridge 48 closest to the recess 26, extends further below the plane 40′ of the lower face 40 than a corresponding portion of the inside edge 62 of the ridge 48 does. Thus, the outer point 50′ of each of the teeth 50 extends further from the plane 40′ than the corresponding inner point 50″ of the same tooth of the teeth 50 does. For each individual tooth of the teeth 32 the outer point 32′ thereof is further from the plane 22′ than the corresponding inner point 32″ thereof. In addition, the part of the tooth connecting points 32′ and 32″ is a curved line. For each individual tooth of the teeth 50 the outer point 50′ thereof is further from the plane 40′ than the corresponding inner point 50″ thereof. In addition, the part of the tooth connecting points 50′ and 50″ is a curved line. Moreover, as shown in FIG. 5, the inside edge of each base tooth of the teeth 32 is a curved surface which is convex with respect to the outside edge 56 of each such tooth. The cover teeth are similarly formed with each cover tooth of the teeth 50 having its inside edge a curved surface which is convex with respect to the outside edge 60 of each such tooth. Thus, when the cover 14 is closed on the base 12, the cutting of the foil positioned therebetween will begin along the outer edges 56 and 60 of the ridges 30 and 48, respectively, with the foil being rolled and folded by curved lines connecting the outer and inner points of the individual teeth and the curved convex surfaces of the individual teeth.

For operation of the molding device 10, the cover 14 is opened with reference to the base 12 as is shown in FIG. 3. A portion of malleable material 64 is formed into a patty (similar to the shape of a hamburger patty) and is then positioned between two sheets of nonstretchable material 66 and 68, such as aluminum foil. The malleable material could be putty or a modeling compound such as distributed by Rainbow Crafts, Inc. under the trade mark Play-Doh. The patty 64 positioned between the sheets 66 and 68 of nonstretchable material is then positioned as shown in FIG. 3. The cover 14 is then brought down upon the base 12 as is shown in FIG. 6. The teeth 32 and 50 cut through the sheets 66 and 68 and the malleable material 64 as the cover is brought into the position shown in FIG. 6 as follows. First the teeth 32 and 50 squeeze the sheets 66 and 68 into the malleable material 64 and thereby partially roll such sheets into the malleable material where they contact such sheets. As the teeth 32 and 50 meet further resistance because of the malleable material between said sheets in the area of said teeth, the teeth begin to puncture the sheets 66 and 68. These punctures provide a controlled line of tear or parting of the sheets 66 and 68 of the same general outline formed by the ridges 30 and 48. As the cover 14 moves closer to the base 12 the sheets 66 and 68 begin to part along a line which coincides with the outer edges

56 and 60 of the ridges 30 and 48, respectively. As the cover 14 closes further on the base 12, the sheets 66 and 68 are forced toward the corners of the recesses 26 and 44 formed by the faces of the dies 34 and 52 with the inside edges 58 and 60, respectively, by the malleable material 64, and also the sheets 66 and 68 wrap around the malleable material 64 and cover the side edges thereof adjacent the interior or inside edges 58 and 62 of the ridges 30 and 48, respectively.

During the time that the cover 14 is being closed on the base 12 and prior to the time that the teeth 32 of the base 12 are meshed with the teeth 50 of the cover 14 as shown in FIG. 6, the second ridge 38 is believed to control both the flow of the malleable material 64 away from the recesses 26 and 44 and the movement of the sheets 66 and 68.

After the cover 14 and base 12 reach the position shown in FIG. 6, the cover 14 is then opened with reference to the base 12 and the sheet 66, malleable material 64, sheet 68 laminated product is removed from the recesses 26 and 44. Any excess sheet material or malleable material not completely severed from the product previously residing within the confines of the recesses 26 and 44 can be removed by hand at this point because of the perforations and indentations placed in the sheets 66 and 68 and the malleable material 64 by the teeth 32 and 50.

FIG. 9 illustrates the front view of a charm or medallion 70 formed in a device of the present invention by the use of a die embossed as shown in FIG. 7.

Up to this point very little has been said concerning the type of nonstretchable material that can be used as sheets 66 and 68. This is so inasmuch as various sheet or foil products can be used for this purpose with a device of the envisioned type. For example, waxed paper, ½-mil aluminum foil with ½-mil paper backing, and aluminum foil from 0.0005 inches to 0.0015 inches thick can be used. The molds could be made of general purpose plastic, high impact plastic, or medium impact plastic. General purpose plastic—Dow 451 **and general purpose plastic—Dow** 685 distributed by the Dow Chemical Co. are examples of general purpose plastics that could be used to form the mold of the present invention. The designs embossed on the dies 34 and 52 can be any desired design, but the impressions in the dies should not be greater in depth than 0.02 inches for best results.

In the view of the principles set forth herein, we have shown some of the ways of carrying out the present invention and some of the equivalents which are suggested by the disclosures.

We claim:

1. A molding device comprising a base, a cover hingedly attached to said base, said base having an upper face with a recess therein, a ridge extending upwardly from the exterior edges of said base recess, said base ridge extending above said base face and being an extension of the exterior edge of said base recess, teeth positioned along the entire upper edge of said base ridge, said cover having a lower face with a recess extending therein, a ridge extending downwardly from said cover recess, said cover ridge extending below said lower face and being an extension of the exterior edge of said cover recess, teeth positioned along the entire lower edge of said cover ridge, said base ridge teeth and said cover ridge teeth being so arranged that when said cover is closed over said base such teeth mesh in cooperative engagement.

2. A molding device as called for in claim 1 wherein the raised portions of said base teeth adjacent the outside edge of said base ridge are further from the plane of said base face than the raised portions of said base teeth adjacent the inside edge of said base ridge, and the raised portions of said cover teeth adjacent the outside edge of said cover ridge are further from the plane of said cover face than the raised portions of said cover teeth adjacent the inside edge of said cover ridge.

3. A molding device as called for in claim 1 having a second ridge extending upwardly from and above the plane of said base face, said second upstanding ridge completely surrounding said base recess ridge and being positioned outwardly from said base recess ridge but being of the same general configuration as said base recess ridge.

4. A molding device as called for in claim 3 wherein the height of said second ridge above said plane is from approximately equal to one-half of the height of said base recess ridge above said plane to approximately equal to the height of said base recess ridge above said plane.

5. A molding device as called for in claim 1 wherein the width of said base teeth is equal to approximately one-half of the depth of said base recess and the width of the said cover teeth is equal to approximately one-half of the depth of said cover recess.

6. A molding device as called for in claim 1 wherein the raised portions of said base teeth adjacent the outside edge of said base ridge are further from the plane of said base face than the raised portions of said base teeth adjacent the inside edge of said base ridge, the raised portions of said cover teeth adjacent the outside edge of said cover ridge are further from the plane said cover face than the raised portions of said cover teeth adjacent the inside edge of said cover ridge, and which has a second ridge extending upwardly from and above the plane of said base face, said second upstanding ridge completely surrounding said base recess ridge and being positioned outwardly from said base recess ridge but being of the same general configuration as said base recess ridge.

7. A molding device as called for in claim 6 wherein the height of said second ridge above said plane is from approximately equal to one-half of the height of said base recess ridge above said plane to approximately equal to the height of said base recess ridge above said plane.

8. A molding device as called for in claim 6 wherein the width of said base teeth is equal to approximately one-half of the depth of said base recess and the width of the said cover teeth is equal to approximately one-half of the depth of said cover recess.

9. A molding device as called for in claim 6 wherein the width of said base teeth is equal to approximately one-half of the depth of said base recess and the width of the said cover teeth is equal to approximately one-half of the depth of said cover recess, and the height of said second ridge above said plane is from approximately equal to one-half of the height of said base recess ridge above said plane to approximately equal to the height of said base recess ridge above said plane.

10. A molding device as called for in claim 9 wherein the surface connecting the raised portions of said base teeth adjacent the outside edge of said base ridge with their corresponding raised portions of said base teeth adjacent the inside edge of said base ridge is curved, the surface connecting the raised portions of said cover teeth adjacent the outside edge of said cover ridge with their corresponding raised portions of said cover teeth adjacent the inside edge of said cover ridge is curved, and the inside edge of said teeth are convex with respect to the outside edge of said teeth.