METHOD OF FORMING A CAST ASSEMBLED MULTIPLE DIFFERENT PART END PRODUCT

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ABSTRACT OF THE DISCLOSURE

Method of interconnecting three interconnected parts to form pivoted connections and a continuous come-apart ring.

This invention deals with the production of a cast end product, wherein the product comprises three or more different parts, which are cast one upon another at a series of stations and coupled with each other and, wherein, the coupling comprises pivots facilitating swinging movement of the parts of the end product. More particularly, the invention deals in a method, wherein the pivots are concealed within the parts, particularly when the parts are in fully collapsed position.

Still more particularly, the invention deals with the formation of an end product comprising an open ring, having a pivotal latch part for closing the ring and a lock lever part pivoted to the latch part for movement of the latch part into operative position and in retention of the latch part in such position.

The novel features of the invention will be best understood from the following description, when taken together with the accompanying drawings, in which certain embodiments of the invention are disclosed and, in which, the separate parts are designated by suitable reference characters in each of the views and, in which:

FIG. 1 is an enlarged side elevation of a three part end product made according to my invention, parts of the construction being broken away and shown in section and omitting part of the end product.

FIG. 2 is a view, similar to FIG. 1, illustrating the parts in a lock position.

FIG. 3 is a plan view of a part of the structure, as seen in FIG. 1, with parts broken away and in section.

FIG. 4 is a section on the line 4—4 of FIG. 2.

FIG. 5 is a section on the line 5—5 of FIG. 1.

FIG. 6 is an enlarged side view showing the coupling hook ends of the device in operative engagement, with parts of the structure broken away and in section.

FIG. 7 is a view, similar to FIG. 3, showing only the lock lever and illustrating a modification; and

FIG. 8 is a diagrammatic view showing the three primary casting stations for successive formation of the three cast parts in production of the resulting end three-part product.

In the drawing, 10 represents one part of the product, namely an open ring part; 11 represents a lock lever part and 12 represents a latch part.

The ring part has, at one end, a reduced tongue 13, having a rounded end 13'; the tongue adjacent the end having side pivot recesses 14, note FIGS. 3 and 4. Where the tongue end 13 joins the body portion of the ring curved side stop shoulders 15 are provided, checking movement of the lock lever, as later described. The other end of the ring part 10 terminates in a coupling hook 16.

The lock lever part 11 has what might be termed a hood-like finger piece portion 17, including depending side walls 18 shaped, as seen at 19 in FIG. 2, to fit upon the stop shoulders 15, as will appear from a consideration of FIG. 1 of the drawing. The part 11 includes a forked extension 20, this extension having opposed pivot apertures 21, note FIGS. 3 and 5. The extension 20 has rounded edges, as seen at 20* in FIG. 2 of the drawing.

The latch part 12 has a forked end 22, note FIGS. 2 and 3, this end defining side walls 23 having projecting pivots 24 seating in the apertures 21, note FIGS. 3 and 5. At this time, it is also to be noted, in FIGS. 3 and 4, that the forked extension 20 has inwardly projecting pivots 25, which are arranged in the pivot recesses 14 of the tongue 13.

The latch part 12 includes a reduced end portion 26, between which and the forked end 22 are formed shoulders 27, as best seen in FIG. 3. Adjacent the shoulders 27, the reduced end portion 26 includes a ring or eye 28, which can be utilized for coupling the end product with any other support. At the end of 26 is a hook 29, similar to the hook 16, and these hooks are adapted to engage each other when the end product is in a closed ring position, the engagement of the two hooks being clearly shown in FIG. 6 of the drawing. It will appear that the hooks have projecting sides 16', 29' which are adapted to engage recesses in the coupling hook ends, 16' engaging a recess 29" in 29 and 29" engaging a recess 16" in the hook end 16. This engagement is clearly illustrated by the sectioning in FIG. 6 of the drawing. By this structure, the ends 16 and 19 are retained against lateral separation from each other, when they are coupled together.

Turning now to FIG. 7 of the drawing, at 11' I have shown a modified form of lock lever part, which differs from the part 11 primarily in providing on the upper or outer surface of the hood portion 17' longitudinally spaced teeth or projections 30, which will provide a positive grip by the fingers in movement of the lock lever part from the position shown in FIG. 2 to the position shown in FIG. 1 when 16 and 29 are in coupled engagement with each other.

Considering FIG. 1 of the drawing, it will appear that the part 10 is recessed, as seen at 31, adjacent the under-cut end 32 of the part 11 and this facilitates lift of the part 11 in movement of the same from the closed or locked position of FIG. 1 to the open position of FIG. 2.

Turning to the diagrammatic showing in FIG. 8 of the drawing, here 33, 34 and 35 represent three successively casting stations of a pair of dies and 36 would represent a trimming station, not shown, as it is well-known in the art, which would be below the station 35. At 37 is shown the gate or sprue for injection of casting material into the respective cavities to form the part 10 at station 33, the part 11 at station 34 and the part 12 at station 35. The gate or sprue 37 has branches 38 leading to the cavity forming the part 10, 39 leading to the cavity forming the part 11, when 10 is positioned in said cavity, and 40 leading to the cavity forming the part 12, when both parts 10 and 11 are in said last named cavity.

In forming the part 10 at station 33, the recesses 14 will be formed; whereas, in forming the part 11 at station 34, the apertures 21 are formed. At the same time, the pivots 25 will be formed in the recesses 14 of the part 10, when positioned at station 34. In like manner, when the part 12 is formed at station 35, the pivots 24 will be formed in the apertures 21.

From the foregoing, it will be apparent that, in successive casting operations, the part 10 is moved from station 33 to 34; the assembled parts at 34 would then be moved to station 35 and the complete assemblage will move from 35 to the trimming station 36, below and beyond station 35, where the gates or sprues will be trimmed from the assembled multiple different part end product, such as more clearly described in connection with the showings in FIGS. 1 to 6, inclusive.

In describing the several casting operations, it will be kept in mind that, in each operation of the casting ma-
3. A method as defined in claim 1, wherein the engaged elements of the first and second parts form a pivotal coupling between said first and second parts.

4. A method as defined in claim 1, wherein the engaged elements of the second and third parts form a pivotal coupling between said second and third parts.

5. A method as defined in claim 1, wherein the engaged elements of the first and second parts form a pivotal coupling between said first and second parts, and the engaged elements of the second and third parts forming a pivotal coupling between said second and third parts.

6. A method as defined in claim 1, wherein the second named part comprises a lock lever including a fingerpiece portion formed upon a projecting tongue of the first part.

7. A method as defined in claim 6, wherein the first and second parts are fashioned to form interengaging means checking one directional movement of the second part with respect to said first part.

8. A method as defined in claim 1, wherein the elements of the couplings between the parts are pivotal, providing swinging movement of the second part on the first part and the swinging movement of the third part on the second part, fashioning the third part to form a forked end receiving end portions of the first and second parts when the respective parts are in collapsed position with respect to each other, and said first and third parts being fashioned to form interengaging coupling hooks.

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