May 28, 1968 L. H. MORIN 3,384,949

METHOD OF FORMING A CAST ASSEMBLED MULTIPLE DIFFERENT PART END PRODUCT

Filed May 19, 1966

FIG. 1.

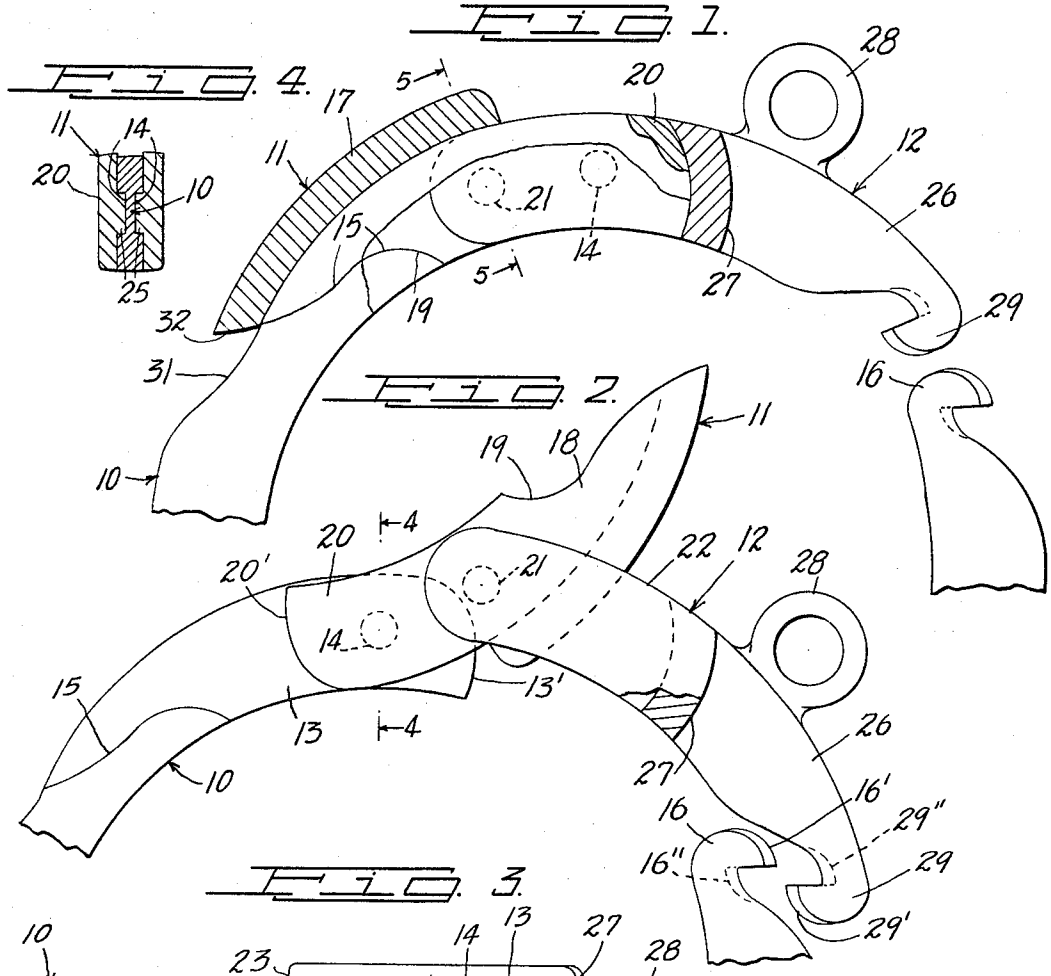


FIG. 4.

FIG. 2.

FIG. 3.

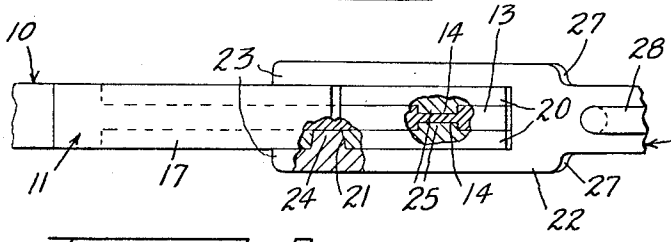


FIG. 6.

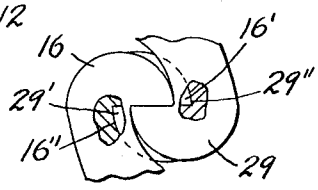


FIG. 8.

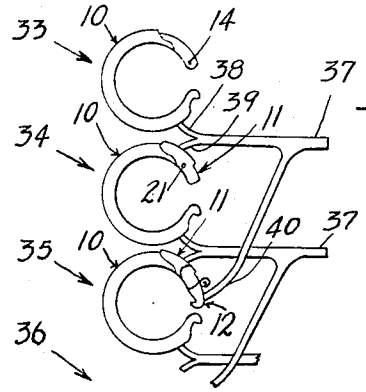


FIG. 5.

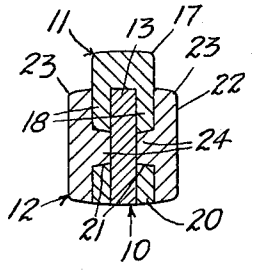
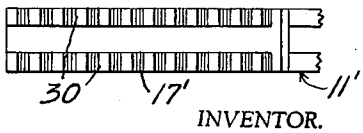


FIG. 7.



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METHOD OF FORMING A CAST ASSEMBLED MULTIPLE DIFFERENT PART END PRODUCT

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ABSTRACT OF THE DISCLOSURE

Method of intercasting 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 the 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 drawing, 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 different 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 fingerpiece 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 undercut 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 successive 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-

chine, a finished product is formed. In other words, when a first part has been moved to the second station, as and when the second part is cast on the shifted first part, another first part is formed at the station 33. Thus, it will be apparent that, in each casting cycle of the machine, a first, second and third part are simultaneously formed.

It will be understood that the showing in the accompanying drawing is illustrative solely of one method of carrying my invention into effect, as various types and kinds of different parts can be cast one upon another in forming a multiple end product of any type or kind and, while pivotal coupling of the parts is here specifically dealt with, in many instances, adjacent cast parts need not have a relative movement one with respect to the other and a coupled relationship between the parts alone would be accomplished. In the accompanying drawing, the parts have been illustrated by sectioning as metallic parts, as this is a simple way of showing the invention. The parts can, however, be composed of plastic materials in the production of various types and kinds of end products.

For purposes of description, the pivot portions, such as 14, 25 and 21, 24, can be termed coupling elements between adjacent parts of the resulting end product.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The method of producing an end product consisting of a multiple of different parts formed one upon the other, which comprises forming a first part at one station, said part including an element of a coupling, forming a second different part on a first part when positioned at a second station, the second part having an element engaging the element of the first part in coupling said parts, said second part further including another element of a coupling, then moving the assembled first and second parts to a third station forming, at said third station, a third part different from said first and second parts, said third part including an element engaging the second named element of said second part to form an assemblage of the three parts, and then moving the three part assemblage to a trimming station in the production of the final end three part product.

2. 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.

3. 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.

4. 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.

5. A method as defined in claim 1, wherein the first and third parts are fashioned to form interengaging coupling hooks.

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.

References Cited

UNITED STATES PATENTS

2,266,432	12/1941	Morin et al.	164—111
2,743,517	5/1956	Everett	29—529
2,768,415	10/1956	Morin	164—90
2,819,494	1/1958	Morin	164—90
3,195,228	7/1965	Beacham	29—430

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