June 18, 1957 E. J. LISZAK 2,795,844

METHOD OF MAKING A HOLLOW ARTICLE

Filed April 21, 1954

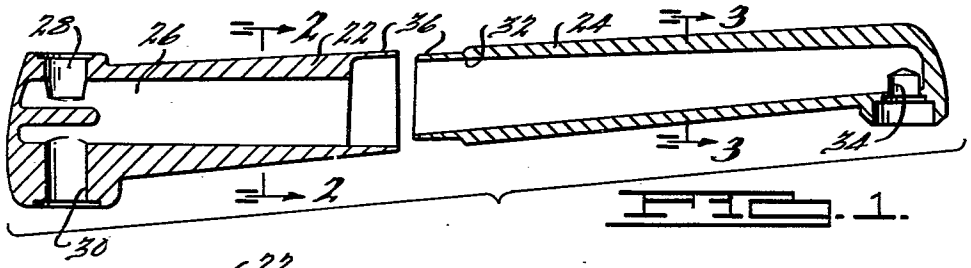


FIG. 1.



FIG. 2.



FIG. 3.

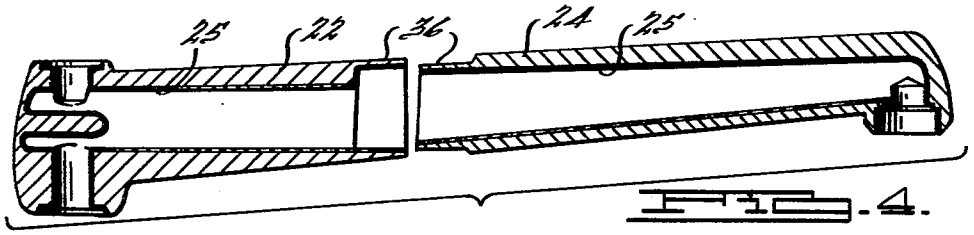


FIG. 4.

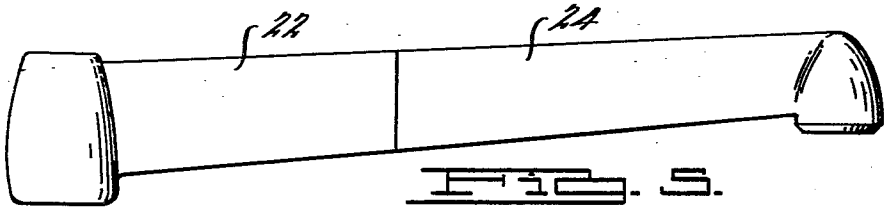


FIG. 5.

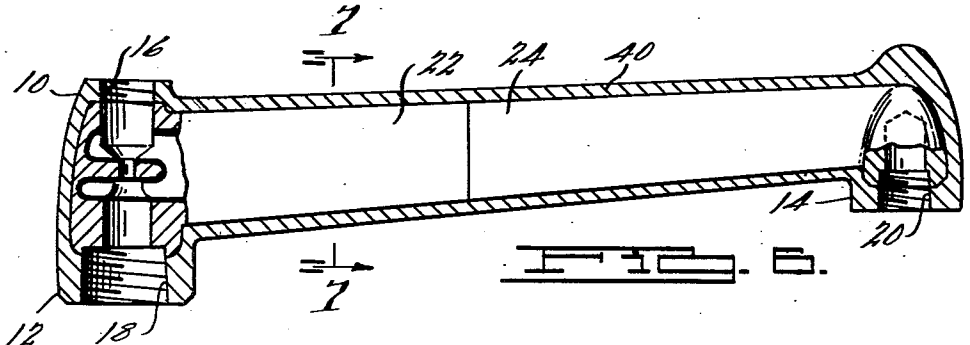


FIG. 6.

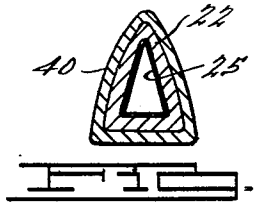


FIG. 7.

INVENTOR.
Eugene J. Liszak
BY
E. J. Ballaff
ATTORNEY

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METHOD OF MAKING A HOLLOW ARTICLE

Eugene J. Liszak, Detroit, Mich., assignor to F. L. Jacobs Co., Detroit, Mich., a corporation of Michigan

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4 Claims. (Cl. 29—458)

This invention relates to a method of making elongated hollow articles, such for example as a spout for a faucet, where a smooth plated and/or polished finish is required on the exterior.

In the past it has been the general practice to make articles of this type from sand castings. However, the time and effort required for buffing and polishing such castings are so great as to make the cost of the finished articles very high. Die castings have not been generally employed for this purpose because the shape of the article and the shape of the passages through the same make it impossible to withdraw the cores.

I have discovered a new and improved method of making hollow articles of this type which permits the use of die casting techniques and which method includes the steps of casting a set of hollow tubular sections in such a manner that each section is provided with an elongated continuous hole having angularly related portions and so that one end thereof is formed to provide a complementary tapered part of a telescoping coupling for joining with the complementary coupling end of the other section, assembling such sections in alignment, and forcing the tapered coupling parts together in telescoped and wedged relationship so that the holes therein form a continuous passage which extends without interruption or break from one end of the assembled sections to the other and so that the assembled sections form a unit, and then die casting metal around the exterior of the unit to form an outer covering therefor while maintaining the interior passage sealed against the entrance of die cast metal thereinto.

While the set of hollow tubular sections may be made as regular sand castings. I prefer to use die castings if the use to which the article is to be put permits.

The invention further contemplates that the holes in the sections may be plated or coated with a coating of a metal different from that of the sections.

A principal object of the invention, therefore, is to provide a novel and improved method of making elongated hollow articles made wholly or in part by die casting techniques.

Other and further objects of the invention will be apparent from the following description and claims and may be understood by reference to the accompanying drawings, of which there is one sheet, which by way of illustration show a preferred embodiment of the invention and what I now consider to be the best mode in which I have contemplated applying the principles of my invention. Other embodiments of the invention may be used without departing from the scope of the present invention as set forth in the appended claims.

In the drawings:

Fig. 1 is a longitudinal sectional view of two sections and illustrating the first step in the method;

Figs. 2 and 3 are cross sectional views taken along lines 2—2 and 3—3, respectively, of Fig. 1;

Fig. 4 is a view similar to Fig. 1 but showing the sections after they have been provided with an interior coating of a metal different than the metal of the sections;

Fig. 5 is an elevational view showing the sections after they have been assembled to form a unit assembly;

Fig. 6 is a longitudinal view, partly in section, showing the finished article; and

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 6.

The finished article as shown in Figs. 6 and 7 is an elongated hollow article having an elongated passage therethrough with bosses 10, 12 and 14 defining openings 16, 18 and 20 which communicate in fluid flow relationship with ends of the passage and in substantially angular relationship thereto. The openings 16, 18 and 20 may, as illustrated, be threaded for receiving fittings or couplings parts with which the article is assembled. While an article having the shape as illustrated in Figs. 6 and 7 may be made from a sand casting, it will be obvious that it does not lend itself to the use of die casting techniques, at least in accordance with conventional practice, because of the impossibility of removing cores. While die cast articles may be readily produced with a smooth outer surface which minimizes the time and effort required for buffing and polishing, the cost of die cast articles, if made in sufficient quantities, is relatively low as compared with the cost of sand casting where a great deal of effort and expense is required for buffing and polishing in order to get a surface which may be satisfactorily finished and/or plated.

According to my method, a set of hollow tubular sections 22 and 24 are formed, preferably by die casting, so that each section is provided with an elongated continuous hole having angularly related portions 26, 28 and 30 in the section 22, and 32 and 34 in the section 24. In addition, each section is cast in such a way that one end thereof forms a complementary tapered part 36 of a telescoping coupling for joining with the complementary coupling end of the other section. The sections 22 and 24 may readily be produced by conventional die casting techniques because the holes therein are disposed so as to permit the withdrawal of the cores. The sections 22 and 24 may each be produced in multiple in separate dies, or sets in multiple may be produced in the same die.

The die cast metal may be any die cast metal currently in use, such as zinc, brass, etc., depending upon the use to which the article is to be put, and I have found it desirable to use a die cast metal which is essentially zinc with a small percentage of aluminum and other metals because of the relatively low cost of such die cast metal. If the use to which the article is to be put requires the use of some other metal, I have found that it will be satisfactory in most instances to provide a plating or coating of such a metal on the walls of the passages or holes in the sections 22 and 24. For example, a coating 25 of copper, nickel, brass, zinc, tin, or lead may be plated or coated on the interior walls of the passage according to any known techniques suitable for this purpose. For example, by coating or plating a coating of copper or brass on the walls of the inner passages of the sections 22 and 24, the sections themselves may be made of a less expensive metal, such as a zinc base die cast metal, without impairing the utility of the article.

After the plating or coating of the interior, the sections 22 and 24 are aligned and forced together so that the tapered coupling parts telescope and wedge in assembled relation, thereby forming a unit assembly and interconnecting the holes in the sections 22 and 24 to form a continuous passage which extends without interruption or break from one end of the assembled sections to the other. I have found it preferable to form fixtures for holding the sections 22 and 24 so that they can be forced together in assembled relation to form a rigid unit, as

illustrated in Fig. 5. This is desirable not only to properly align the parts, but also to join them in such a manner as to prevent the entrance of die cast metal into the interior of the assembly during the final die casting step.

The unit as illustrated in Fig. 5 is then assembled in another die and die cast metal is then die cast around the exterior thereof to form an outer covering therefor and integral bosses at the end about the openings thereof, as illustrated in Fig. 6. In the final die casting step the openings **28**, **30** and **34** are filled by cores which cooperate with the metal of the sections defining the openings so as to seal the openings against the entrance of die cast metal into the interior passage. This is very important in die casting operations as the pressure to which the die cast metal is subjected is very high. In the final die casting operation the die cast metal forms an outer covering **40** around the exterior of the unit assembly and also forms bosses **10**, **12** and **14** about the openings **28**, **30** and **34**.

In carrying out the step of die casting the outer covering around the assembled sections it has been found desirable to carry out the operation in such a manner as to avoid fusion between the metals of the sections **22** and **24** and the covering **40**, as when fusion of the sections **22** and **24** occurs the pressure of the die cast metal in the die will tend to rupture the wall of the sections **22** and **24** and thereby collapse the same or fill the interior of the sections **22** and **24** with die cast metal, which is quite undesirable.

The die cast outer covering **40** is a smooth outer surface which minimizes the problem of plating and polishing the same. The thickness of the interior coating and the outer covering may vary widely, depending upon the use to which the article is to be put.

The hereinbefore described method makes it possible to produce finished articles of this character at a cost which is extremely low compared with the cost of producing articles of this kind in accordance with conventional techniques.

While I have illustrated and described a preferred embodiment of my invention, it is understood that this is capable of modification, and I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. That method of making an elongated hollow article having an elongated passage with openings communicating in fluid flow relationship with the ends of the passage and in substantial angular relationship thereto which includes the steps of: casting a set of hollow tubular sections of metal in such a manner that each section is provided with an elongated continuous hole having angularly related portions and so that one end thereof is formed to provide a complementary tapered part of a telescoping coupling for joining with the complementary coupling end of the other section, assembling said sections in alignment and forcing the tapered coupling parts together in telescoped and wedged relationship so that said holes form a continuous passage which extends without interruption or break from one end of the assembled sections to the other and so that said assembled sections form a unit assembly, and die casting metal around the exterior of said unit assembly to form an outer covering therefor while maintaining said passage sealed against the entrance of die cast metal thereinto.

2. That method according to claim 1 which includes the step of coating the interior walls of said sections with a coating of metal different than that of said sections.

3. That method of making an elongated hollow article having an elongated passage with openings communicating in fluid flow relationship with the ends of the passage and in substantial angular relationship thereto which includes the steps of: die casting a set of hollow tubular sections of die cast metal in such a manner that each section is provided with an elongated continuous hole having angularly related portions and so that one end thereof is formed to provide a complementary tapered part of a telescoping coupling for joining with the complementary coupling end of the other section, assembling said sections in alignment and forcing the tapered coupling parts together in telescoped and wedged relationship so that said holes form a continuous passage which extends without interruption or break from one end of the assembled sections to the other and so that said assembled sections form a unit assembly, and die casting metal around the exterior of said unit assembly to form an outer covering therefor while maintaining said passage sealed against the entrance of die cast metal thereinto.

4. That method of making an elongated hollow article having an elongated passage with bosses defining openings communicating in fluid flow relationship with the ends of the passage and in substantial angular relationship thereto which includes the steps of: die casting a set of hollow tubular sections of die cast metal in such a manner that each section is provided with an elongated continuous hole having angularly related portions and so that one end thereof is formed to provide a complementary tapered part of a telescoping coupling for joining with the complementary coupling end of the other section, coating the interior walls of said sections with a coating of metal different than that of said sections, assembling said sections in alignment and forcing the tapered coupling parts together in telescoped and wedged relationship so that said holes form a continuous passage which extends without interruption or break from one end of the assembled sections to the other and so that said assembled sections form a unit assembly, and die casting metal around the exterior of said unit assembly to form an outer covering therefor and integral bosses at the ends about the openings thereof while maintaining said passage sealed against the entrance of die cast metal thereinto.

References Cited in the file of this patent

UNITED STATES PATENTS

1,989,996	Mautsch	Feb. 5, 1935
2,119,056	Peterson	May 31, 1938
2,219,471	Davis	Oct. 29, 1940