Jan. 6, 1942. A. J. CUNNINGHAM 2,269,010

METHOD OF MANUFACTURING STEMMED GLASSWARE

Filed Oct. 20, 1939

FIG. 1.

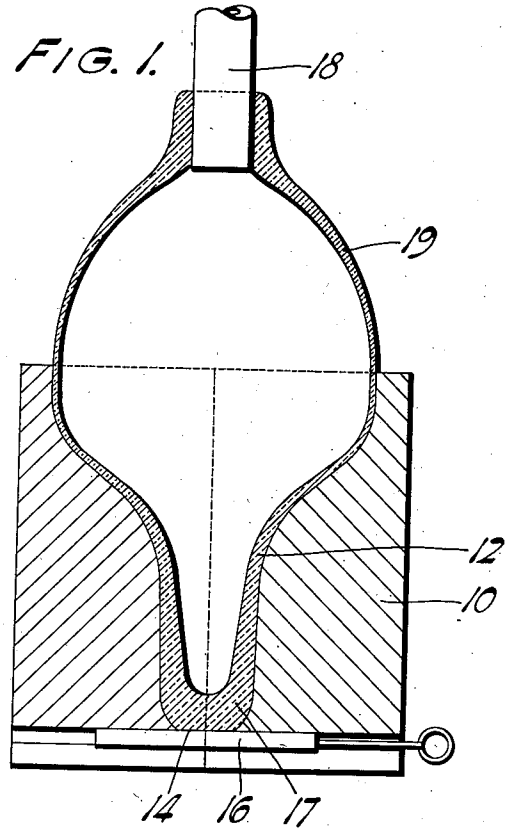


FIG. 4.

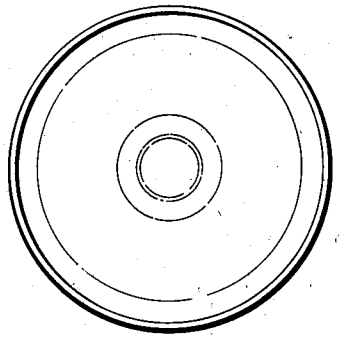
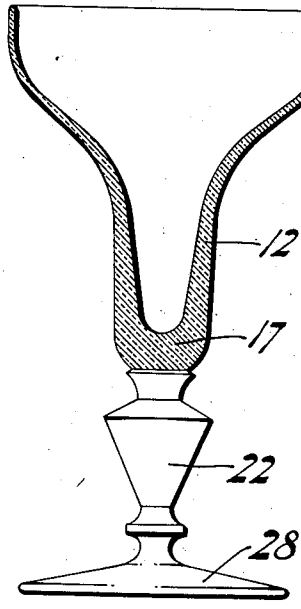


FIG. 3.



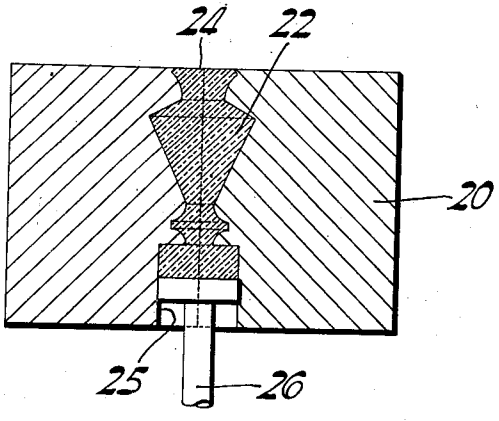


FIG. 2.

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Patented Jan. 6, 1942 2,269,010

UNITED STATES PATENT OFFICE

2,269,010

METHOD OF MANUFACTURING STEMMED GLASSWARE

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Application October 20, 1939, Serial No. 300,409

2 Claims. (Cl. 49—80)

This invention relates to hollow stemmed glassware, and has for one of its objects the provision of an improved drinking vessel of the ornamental hollow stem goblet type. Another object is to provide a simplified and improved method of manufacturing glassware of the hollow stem goblet type. Other objects and advantages of the invention will appear from the specification herein.

Previous conventional methods of manufacturing glassware of the hollow stem types have involved separate manufacture of the bowl and the hollow stem portions and subsequent assembly thereof by means of blowing and finishing processes performed by skilled workmen. In connection with such methods it is extremely difficult to produce the lower bowl wall and hollow stem portions thereof of desirable sectional thickness from the standpoint of the expected rigors to be imposed upon the completed structure. Also, such prior methods of manufacture usually involve free hand blowing processes and the like, and are undesirably complicated and expensive because of the amount of manual labor involved, and are totally unsuited to application in automatic machine operations. Consequently, the products of such previous methods are faulty from the standpoint of structural strength; are relatively expensive to manufacture; and are generally non-uniform in quality.

The present invention contemplates the blowing of a combination bowl and hollow stem structure as an integral unit in a sectional mold which is shaped complementary to the prescribed outer contour of that portion of the article. The mold is provided with a port at the bottom of the stem forming opening thereof which is normally closed by means of a gate device. The lower solid section of the stem or foot of the goblet is simultaneously formed by pressing heated glass into a lower sectional mold while the latter is being supported adjacent the lower end of the upper mold with the glass receiving openings of the mold in registry with one another; the gate having been first removed. The lower stem or foot pressing operation is so performed as to provide extrusion of molten glass upwardly from the lower mold and into fusing contact with the lower end of the upper hollow stem portion of the goblet being formed to form a durable connection therebetween. Upon removal of the united bowl and stem or foot structure from the molds additional end pieces may be mounted thereon if desired in the manner of any suitable glass working methods; the lower end section of the structure being of such strength as to receive attachment of additional members thereon in an improved manner.

In the drawing:

Fig. 1 is a diagrammatic vertical sectional view illustrating a step of the combination bowl and hollow stem blowing process of the invention;

Fig. 2 is a vertical sectional view through the lower mold device used in connection with the method of the invention;

Fig. 3 is a view, partly in section, of a typical form of glass goblet produced by the method of the invention; and

Fig. 4 is a top plan view of the goblet of Fig. 3.

Fig. 1 illustrates diagrammatically a step of the combination bowl and hollow stem blowing process, wherein there is employed a mold 10 shaped interiorly in such manner as to complement the desired outer contour of the finished bowl and hollow stem portion 12 of a drinking goblet. The mold 10 is provided with a bottom opening 14 and a gate 16 normally closing the latter. The requisite amount of glass is first collected on a blow pipe 18 in the usual manner. The glass is then partially blown into bulb form and then marvered at its lower end into the approximate shape of the mold interior. The bulb is then lowered into the mold 10 and blown into the form illustrated in Fig. 1. Particular attention is called to the fact that in connection with this method of forming the glass bulb, both prior and subsequent to insertion within the mold 10 the molten glass naturally gravitates toward the lower portion of the bulb and automatically provides the lower wall portions of the stem of increasing sectional thickness converging at the bottom of the mold into a thickened solid end section 17. Thus, the final blowing process in the mold 10 provides the style of goblet wall formation illustrated in Fig. 1 and avoids undesirable thinning of the lower wall portions such as results in conventional bowl blowing processes; and an integral bowl and hollow stem structure is provided wherein the lower wall portions thereof increase gradually in thickness toward the lower end thereof which is of solid glass form. Consequently, the hollow stem structure is adapted to be subsequently connected to a sub-stem or foot element in an improved manner and whereby the completed goblet is capable of withstanding the rigors of use in an improved manner.

Near the end of the combination bowl and stem blowing process hereinabove described the formation of the lower sub-stem section 22 of the goblet is started by pouring a charge of glass

into a sectional mold **20** (Fig. 2) which is interiorly shaped to complement the desired outer form of the sub-stem portion. At its upper end **24**, the mold interior opens into the upper face of the mold block, and elsewhere is in communication with a glass supply reservoir **25**. The upper face of the mold **20** is then brought into abutting relation with the bottom of the mold **10**; the gate **16** having been first removed from the lower end opening **14** of the mold **10** and the openings **14** and **24** being thus brought into registry with one another. The molten glass in the lower mold is then rammed in the mold interior by means of a plunger **26** whereby it is caused to completely fill the mold space and simultaneously press upwardly through the opening **24** and into fused connection with the lower solid end **17** of the hollow stem. Upon cooling of the glass, the molds **10** and **20** are removed, and the excess glass **19** of the bulb trimmed away from the desired rim line of the bowl by any suitable method.

In connection with the sub-stem pressing step of the invention the charge of glass in the reservoir **25** may be so regulated in quantity as to provide a button of excess glass at the lower end of the sub-stem **22** of sufficient size to provide the necessary material for a spinning operation whereby a foot **28** (Fig. 3) may be provided subsequent to removal from the molds and reheating of the excess glass button. Or, the pressing process may be confined solely to the formation of the sub-stem **22** and a foot **28** subsequently attached by any suitable method as by sticking thereto a small bulb of heated glass and then opening it out and flattening it into the desired shape.

A particular advantage of the method of the invention resides in the fact that the side wall portions of the blown stem section may be easily provided of increasing thickness towards the point of juncture with the sub-stem structure because of the marvering operation and the action of the forces of gravity upon the heated glass. Consequently, an extremely rugged stem construction and joint with the sub-stem structure is provided, and the finished glassware is of improved strength without sacrifice of pleasing thin drinking-edge form.

It will be understood that the blowing and pressing processes of the invention may be performed by means of completely automatic machinery or by labor of relatively inexpensive class when compared to the class of workmen required for free-hand glass blowing methods. It will also be understood that the wall thickness of the bowl and hollow stem sections of the structure may be varied throughout according to the requirements for strength in the finished product, by suitably conducting the glass heating and marvering operations preparatory to the final mold blowing step in such manner as to dispose the necessary masses of glass at the required sections of the structure. Another advantage of the invention resides in the fact that because the lower end portion of the hollow stem section **12** is of increased wall thickness it will be capable of receiving ornamental cuttings of substantial depth without undue weakening of the structure. Consequently the stem may be fluted, or the like, to increase the grace of its appearance while the rugged characteristics of the structure are substantially retained.

Although only one form of the invention has been shown and described in detail, it will be apparent to those skilled in the art that the invention is not so limited but that various changes may be made therein without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. The method of manufacturing a hollow stem type glass goblet including the steps of marvering molten glass on a blow tube into the approximate form of a combination bowl and hollow stem portion of said goblet, blowing the marvered molten glass into a mold shaped complementary to the prescribed form of said bowl and hollow stem portion and mold-pressing a charge of molten glass into the form of the goblet sub-stem portion and into fusing contact with said hollow stem portion while the latter is supported within said combination bowl and hollow stem mold while regulating said charge of molten glass so as to form a button of excess glass at the bottom of said sub-stem portion, and subsequently reforming said button of excess glass into a foot portion of said goblet.

2. The method of manufacturing a hollow stem type glass goblet including the steps of marvering molten glass on a blow tube into the approximate form of a combination bowl and hollow stem portion of said goblet, said marvering being effected with the molten glass depending from the blow tube to produce a bowl and hollow stem portion of progressively increasing thickness toward the bottom under the influence of gravity acting on the glass whereby the wall of the hollow stem portion is substantially thicker than the wall of the bowl portion, blowing the marvered molten glass into a mold shaped complementary to the prescribed form of said bowl and hollow stem portion and mold-pressing a charge of molten glass into the form of the goblet sub-stem portion and into fusing contact with said hollow stem portion while the latter is supported within said combination bowl and hollow stem mold while regulating said charge of molten glass so as to form a button of excess glass at the bottom of said sub-stem portion, and subsequently reforming said button of excess glass into a foot portion of said goblet.

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