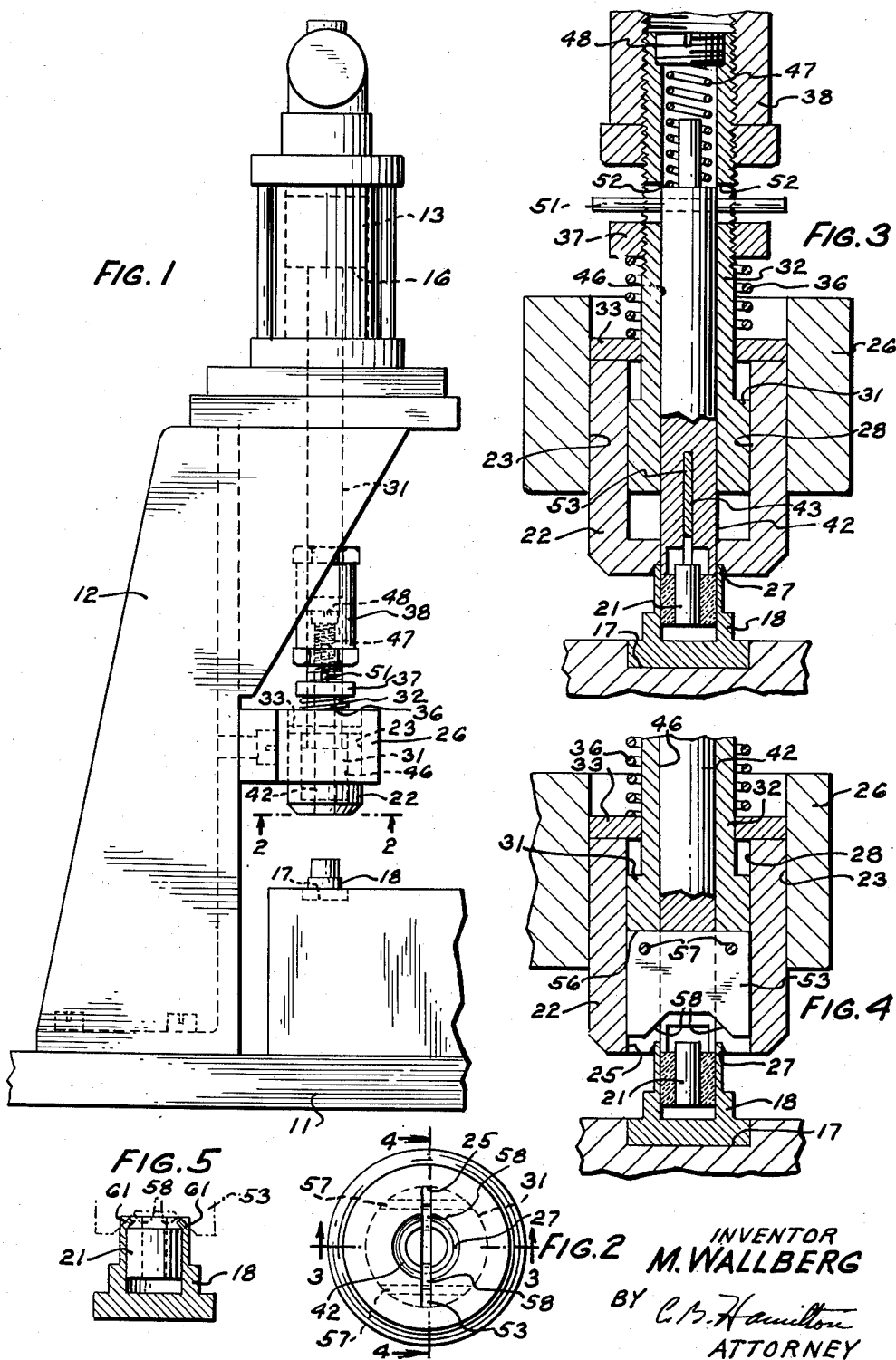


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TOOL FOR FORMING TABS ON CYLINDRICAL
SHELL BY CUTTING AND BENDING
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TOOL FOR FORMING TABS ON CYLINDRICAL SHELL BY CUTTING AND BENDING

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5 Claims. (Cl. 153—1)

This invention relates to forming devices and more particularly to devices for forming the ends of hollow members to retain articles therein.

An object of this invention is to provide a device for forming the ends of tubes to retain articles therein.

Another object of this invention is to provide a device for forming tabs on the end of a hollow member for retaining a protector block assembly therein.

One embodiment of the present invention for forming tabs on the end of a cylindrical shell may include a longitudinally slotted cylindrical rod which is extended into the end of the shell and has a longitudinally slotted hold-down member slidably mounted on the rod for engaging the shell to hold it on a base. A cutter, which is slidably mounted in slots in the rod and the hold-down member, has inclined cutting surfaces which engage portions of the shell to force these portions into the slot in the rod to thus form tabs which retain a protector block assembly inside the shell.

Other objects and advantages of the invention will become apparent by reference to the following detailed description and the accompanying drawing illustrating a preferred embodiment of the invention, in which:

Fig. 1 is a front view of the device showing it in normal unactuated position;

Fig. 2 is an enlarged view taken on line 2—2 of Fig. 1 showing the manner in which the cutter is mounted in the slots in the rod and the hold-down member;

Fig. 3 is a fragmentary vertical sectional view taken on line 3—3 of Fig. 2 showing the cutter mounted in the rod and the hold-down member holding a shell on the base;

Fig. 4 is a fragmentary sectional view taken on line 4—4 of Fig. 2 showing the contour of the cutter; and

Fig. 5 is a sectional view of the protector block shell showing the tabs formed by the cutter.

Referring now in detail to the drawing, a base 11 is shown supporting a mounting bracket 12 (Fig. 1) which supports an air cylinder 13 of a well-known type having a piston 16. A nest 17 in the base 11 beneath the air cylinder 13 receives a cylindrical protector block shell 18 of a well-known type having an open upper end and containing a porcelain and carbon protector block assembly 21.

A centrally apertured hold-down member 22 slidably mounted in a bore 23 in a block 26 secured to the bracket 12 has a recess 27 on its lower portion for receiving the upper end of the shell 18 to retain it in the nest 17 on the base 11. The hold-down member 22 has a slot 25 and an axial bore 28 in which an enlarged lower end 31 of a hollow shaft 32 is slidably mounted. A washer 33 secured to the hold-down member 22 above the enlarged lower end 31 of the shaft 32 retains it in the hold-down member 22. A compression spring 36 mounted on the shaft 32 between the washer 33 and a ring 37 (Figs. 1 and 3) secured to the shaft urges the hold-down member 22 downward whereby, in normal position, the washer 33 engages the enlarged end 31 of the shaft 32. The

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upper end of the shaft 32 is threaded into a nut 38 (Figs. 1 and 3) which is threaded onto a driving rod 31 (Fig. 1) connected to the piston 16 whereby the shaft 32 is moved when the piston 16 is actuated.

A rod 42 equal in diameter to the internal diameter of the shell 18 and having a longitudinal slot 43 (Fig. 3) is slidably mounted in a central bore 46 in the shaft 32. A spring 47 (Figs. 1 and 3) retained in the central bore 46 by a plug 48 urges the rod 42 downward in the hollow shaft 32. Movement of the rod 42 in the hollow shaft 32 is limited by a stop pin 51 (Figs. 1 and 3) which is secured to the rod 42 and which projects through vertically elongated apertures 52 (Fig. 3) in the shaft 32. The lower end of the rod 42 is recessed whereby it will not engage a central raised portion of the protector block assembly 21 when the rod 42 is inserted into the upper end of the shell 18.

A cutter 53 mounted in the slots 25 and 43 in the hold-down member 22 and the rod 42, respectively, is tightly secured in a slot 56 (Fig. 4) in the shaft 32 by a pair of pins 57 which pass through the shaft 32 and the cutter 53. The lower portion of the cutter 53 has a pair of inclined surfaces 58 (Fig. 4) which, when the cutter 53 is lowered, engage the shell 18 and force portions or tabs 61 (Fig. 5) of it into the slot 43 in the rod 42, these portions or tabs 61 retaining the protector block assembly 21 in the shell 18.

In operation, the protector block shell 18 containing the protector block assembly 21 is positioned in the nest 17 in the base 11 and compressed air (from a source not shown) is admitted to the air cylinder 13 to actuate the piston 16 downward. The shaft 32, the hold-down member 22 and the rod 42 are carried downward by the piston 16. The hold-down member 22 moves downward until it is stopped by engagement with the shell 18, the upper end of the shell 18 entering the recess 27 in the hold-down member 22. Further movement of the shaft 32 compresses the spring 36 to hold the shell 18 in place. At the same time that the hold-down member 22 engages the shell 18, the lower end of the rod 42 enters the shell 18 and is stopped by engagement with the protector block assembly 21. As the shaft 32 continues to move downward to carry the cutter 53 toward engagement with the shell 18 the spring 47 is compressed and the pin 51 secured to the rod 42 moves relatively upward in the apertures 52 (Fig. 3) in the shaft 32. Upon further downward movement of the shaft 32 the surfaces 58 of the cutter 53 engage two portions of the shell 18 and force them into the slot 43 in the rod 42, these portions or tabs 61 (Fig. 5) serving to retain the protector block assembly 21 in the shell 18.

The piston 16 is then actuated to raise the shaft 32 and the cutter 53. The rod 42 begins to move upward when the pin 51 engages the bottoms of the apertures 52 in the shaft 32, and the hold-down member 22 begins to move upward when the washer 33 is engaged by the enlarged end 31 of the shaft 32.

The shell 18 with its formed tabs 61 now holding the protector block assembly inside is removed from the base 11 and another protector block shell 18 is then positioned in the nest 17 and the above procedure is repeated.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of this invention. Numerous other arrangements may be readily devised by those skilled in the art to embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A device for fabricating hollow articles, comprising a base for holding the article, support means on the base, a tubular member movably mounted on the support means, a slotted member slidably supported on said

tubular member for engaging the hollow article to hold it on the base, a slotted element slidably mounted in said tubular member for entering the end of the hollow article, a cutter secured to the tubular member and slidably mounted in the slots in the slotted member and the slotted element for engaging the article to force portions of it into the slot in the element, and means for actuating the tubular member.

2. A device for fabricating hollow articles, comprising a base for supporting an article, support means on the base, a member movably mounted on the support means, an apertured member mounted on said member and movable into engagement with the article to hold it on the base, resilient means on the movable member for urging the apertured member toward the article, said apertured member also having a longitudinal slot, a slotted rod slidably mounted on the movable member and in the aperture in the apertured member for entering the article, resilient means on the movable member for urging the rod toward the article, a cutter carried by said movable member and slidably mounted in the slots in the apertured member and the rod for engaging the article to force portions of it into the slot in the rod, and means for actuating the movable member to operate the cutter, said apertured member and rod also being operated by the cutter actuating means.

3. A device for forming tabs in the end of a cylindrical shell, comprising a base for supporting a shell, a bracket mounted on the base, a vertical shaft supported by the bracket and having a central bore, means mounted on the bracket for reciprocating the shaft, a slotted member slidably mounted on the shaft for engaging the shell to hold it on the base, resilient means mounted on the shaft for urging said slotted member toward the shell, a slotted rod slidably mounted in the bore in the shaft for entering the end of the shell, resilient means mounted in said bore for urging the rod into said shell, and a cutter carried by the shaft and slidable in the slots in the rod and the member for cooperating with the rod to force portions of the shell into the slot in the rod to form tab portions extending into the shell.

4. A device for forming tabs on the end of a cylindrical shell, comprising a base having a nest for receiving one end of a shell, a bracket mounted on the base, a vertical

shaft supported by the bracket and having a central bore, means mounted on the bracket for vertically reciprocating the shaft, an apertured and slotted member slidably mounted on the shaft for engaging the shell to retain it in the nest in the base when the shaft is lowered, resilient means mounted on the shaft for urging the member downward relative to the shaft, said resilient means being compressed as the shaft continues to move downward through the member after it engages the shell, a slotted rod slidably mounted in the central bore in the shaft, a spring mounted in said central bore above the rod for urging the rod downward relative to the shaft, said spring being compressed as the shaft continues to move downward after the rod enters the shell, and a cutter secured to the shaft and slidably mounted in the slots in the rod and member for engaging the shell to force portions of it into the slot in the rod to form tabs extending into the shell.

5. A device for fabricating tabs on an open end of a cylindrical shell, comprising a base for engaging and supporting the shell, a bracket secured to the base, a shaft mounted on the bracket for movement along the axis of the shell and having a central bore, a rod mounted in said central bore for entering the open end of the shell, said rod having a transverse longitudinal slot, resilient means interconnecting the shaft and the rod for urging said rod toward the shell, a member slidably mounted on the shaft for engaging and holding the shell on the base, resilient means interconnecting the shaft and said member for urging said member toward the shell, said member having a transverse slot aligned with the slot in the rod, a cutter secured to the shaft and slidably mounted in the slots in said rod and said member for engaging the shell to force portions thereof into the slot in the rod to form tabs, and means on the bracket for moving the shaft.

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