Jan. 25, 1955 C. H. TRIMBLE 2,700,407

ARTICLE-FORMING APPARATUS

Filed Sept. 20, 1950

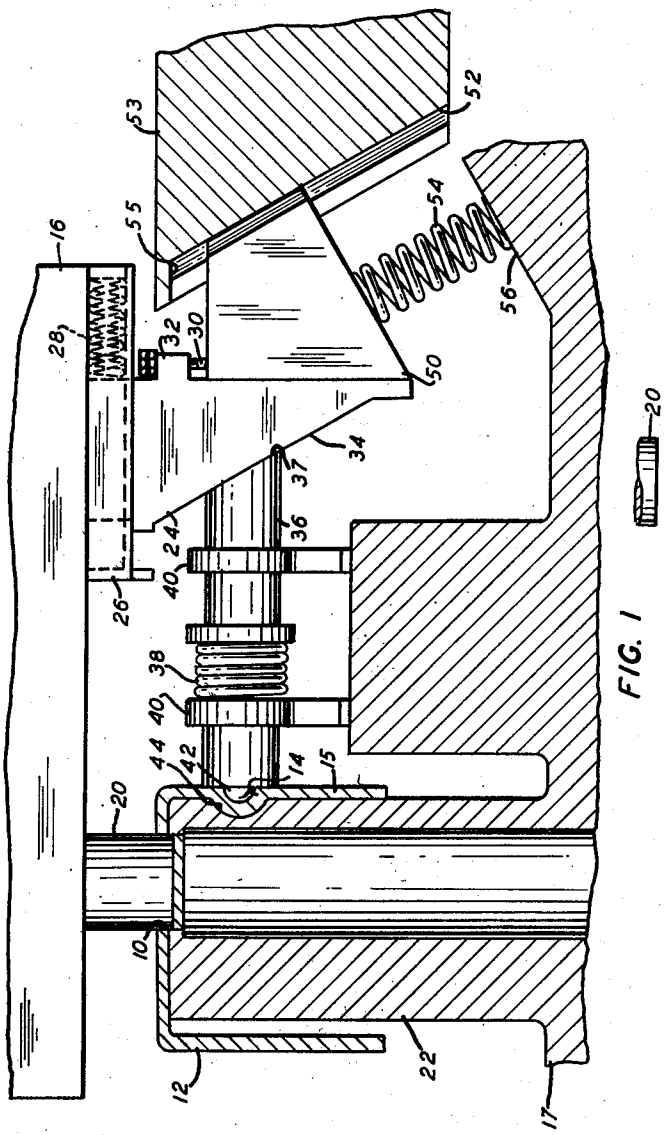


FIG. 1

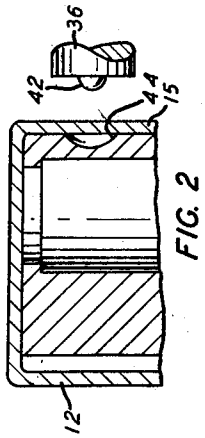


FIG. 2

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United States Patent Office 2,700,407 Patented Jan. 25, 1955

2,700,407

ARTICLE-FORMING APPARATUS

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Application September 20, 1950, Serial No. 185,742

3 Claims. (Cl. 153—48)

This invention relates to article-forming apparatus, and more particularly to apparatus for performing operations on two sides of an article disposed at right angles to one another.

In the manufacture of cup-like articles requiring punching or forming operations on sides of an article at right angles to one another, a punch press of a reciprocable type is sometimes used with a reciprocable working element carried by the platens and a cross-slide carried by one of the platens to effect the other forming operation. Such a press sometimes includes a cam mounted on a movable platen for actuating the cross-slide forming element prior to the operation of the forming element carried by the movable platen, and it has been impossible with previously known apparatus to avoid a trigger action of the cam prior to dwell action of the cross-slide whereby heavy maintenance is required for the cam.

An object of the invention is to provide new and improved article-forming apparatus.

A further object of the invention is to provide new and improved apparatus for performing operations on sides of an article disposed at right angles to one another.

Another object of the invention is to provide new and improved apparatus for performing work on a side of an article through a cam and then performing work on a side of the article at right angles thereto.

An apparatus illustrating certain features of the invention may include a platen, a second platen movable toward and away from the first-mentioned platen. A material-working element is carried with the second-mentioned platen, and a cross-slide is mounted on the first-mentioned platen for movement across the face of that platen. A wedge carried by the second-mentioned platen and slidable across the face thereof is designed to move the cross-slide into engagement with a blank on the first-mentioned platen as the second-mentioned platen is moved theretoward before the material-working element engages the blank, and a presser holds the wedge against the cross-slide. Means also may be provided for guiding the presser in a direction providing dwell motion of the cross-slide.

A complete understanding of the invention may be obtained from the following detailed description of an apparatus forming a specific embodiment thereof, when read in conjunction with the appended drawing, in which:

Fig. 1 is a fragmentary, vertical, partially sectional view of an apparatus forming one embodiment of the invention, and

Fig. 2 is a fragmentary, vertical, partially sectional view of a portion of the apparatus shown in Fig. 1.

Referring now in detail to the drawing, there is shown therein a punch press for forming a hole **10** in the end of a cup **12**, and for forming a dimple **14** in the same operation in a side portion **15** of the cup. The punch press includes a movable platen **16**, which is reciprocated toward and away from a stationary platen **17** by suitable means (not shown). The punch press carries a punch **20** cooperable with a die **22** mounted on the platen **17** to punch out the hole **10** in the cup **12**.

A cam **24** is mounted on a guideway **26** secured to the movable platen **16**, and is urged to the left, as viewed in Fig. 1, by a compression spring **28**. An adjustment screw **30** is mounted on a lug **32** formed on the cam **24**. The cam **24** is generally wedge-shaped and is provided with a surface **34** engaging a cross-slide, forming tool **36** having a cam follower surface **37**. The tool **36** is urged toward the right, as viewed in Fig. 1, by a compression

spring **38**, and is mounted slidably in guides **40—40** positioned on the stationary platen **17**. At the left hand end of the tool **36**, a button **42** is formed which cooperates with a recess **44** formed in the die **22** to form the dimple **14** therein. A guide block **50** is urged upwardly along a dovetailed guideway **52** paralleling the surface **34** by a compression spring **54**, which is positioned between the guide **50** and a fixed abutment **56**. The guideway **52** is formed in a guide **53** which is fixed with respect to the stationary platen **17**, and at its upper end this guideway is provided with a stop **55** for limiting the upward movement of the block **50**.

Operation

With the movable platen **16** withdrawn from the stationary platen **17** to a position in which the punch **20** is positioned substantially above the die **22** and the cam **24** raised to a position in which the tool **36** is spaced substantially away from the die **22**, the cup **12** is placed on the die **22**, and the punch press is actuated to move the platen **16** toward the platen **17**. As the platen **16** is so moved, the cam **24** is moved downwardly to move the tool **36** to the left, as viewed in Fig. 1, until the button **42** forms the dimple **14** in the cup **12**. Then, as the platen **16** continues to approach the platen **17**, the adjustment screw **30** engages the guide block **50** and moves the guide block **50** downwardly along the guideway **52**, the cam **24** sliding laterally toward the right along the guideway **26** as this occurs. The punch **20** comes into engagement with the cup **12** during this movement, and punches the hole **10** in the cup. The platen **16** then is moved out of its retracted position, and the guide block **50** is raised by the action of the compression spring **54** and moves back against the stop **55**, after which the cam **24** moves on upwardly, and the adjustment screw **30** is moved away from the guide block **50** and the tool **36** is moved substantially away from the cup **12**.

The above-described apparatus sequentially forms the dimple **14** and the hole **10** in the cup **12** on right angle sides thereof without any trigger action in the operation of the cam **24** and the tool **36**. Thus, dwell is provided without the excessive wear and maintenance required for conventional cams.

What is claimed is:

1. A press for performing an operation on a side of a cup-shaped article, which comprises a stationary lower platen, a die mounted on the lower platen upon which such an article may rest, an upper platen reciprocable toward and away from the stationary platen, a forming tool slidably mounted for lateral movement across the lower platen for performing an operation on a side of the article, resilient means for urging said forming tool away from the die, a cam slidably mounted for lateral movement across the upper platen and having an actuating surface inclined with respect to the vertical for contacting the end of said forming tool to force it toward the article when the upper platen moves toward the die, a stationary guideway parallel to the actuating surface of the cam, a guide block slidably mounted in the guideway for engaging the side of the cam opposite to the actuating surface thereof, and means for urging the guide black along the guideway toward the cam.

2. A press for performing an operation on a side of a cup-shaped article, which comprises a stationary lower platen, a die secured to said lower platen so that such an article may be supported thereon, an upper platen reciprocable vertically toward and away from the lower platen, a forming tool mounted slidably on the lower platen and reciprocable laterally across the lower platen to cooperate with the die in performing an operation on a side of the article supported thereon, a transverse guideway mounted on the upper platen, a wedge-shaped cam mounted slidably in the guideway for lateral movement across the upper platen, said cam having an actuating surface inclined with respect to the vertical and designed to push the forming tool towards the die when the upper platen is moved towards the lower platen, a guide block mounted for engagement with the side of the cam opposite to the actuating surface thereof and movable in a direction parallel to said actuating surface, and

resilient means for urging the guide block towards the cam.

3. A press for performing an operation on a side of a cup-shaped article, which comprises a stationary lower platen, a die secured to said lower platen so that such an article may be supported thereon, an upper platen reciprocable vertically toward and away from the lower platen, a forming tool mounted slidably on the lower platen and reciprocable laterally across the lower platen to cooperate with the die in performing an operation on a side of the article supported thereon, a transverse guideway mounted on the upper platen, a wedge-shaped cam mounted slidably in the guideway for lateral movement across the upper platen, a spring positioned in the guideway for urging the cam along the guideway towards the die, said cam having an actuating surface inclined with respect to the vertical and designed to push the forming tool towards the die when the upper platen is moved towards the lower platen, a backup guide fixed with respect to the lower platen, a guide block mounted slidably on the backup guide and movable in a direction parallel to the actuating surface of the cam, resilient means for urging the guide block along the backup guide into engagement with the side of the cam opposite to the actuating surface thereof, and adjustable means for varying the spacing between the guide block and the cam.

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