Dec. 5, 1944. A. O. RIDDLE, JR 2,364,243

ARTICLE ALIGNING DEVICE

Filed Dec. 10, 1942

Fig. 1.

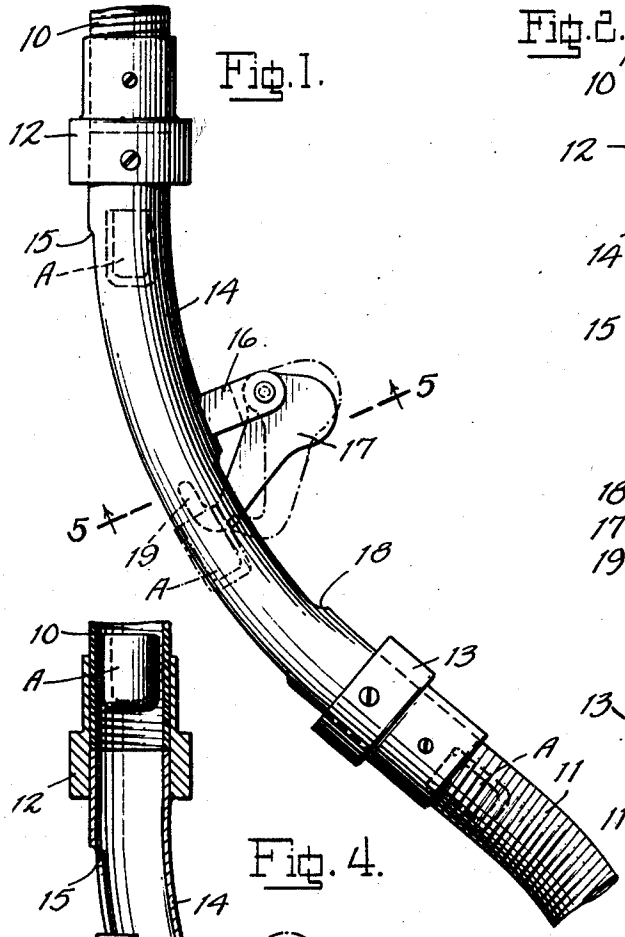


Fig. 2.

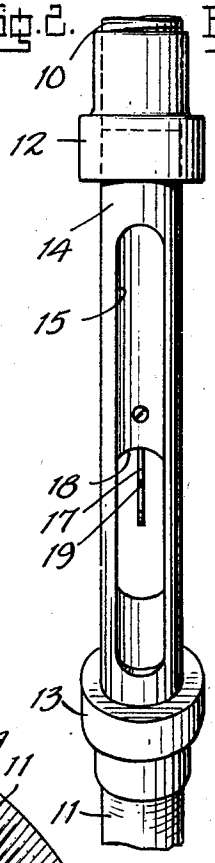


Fig. 3.

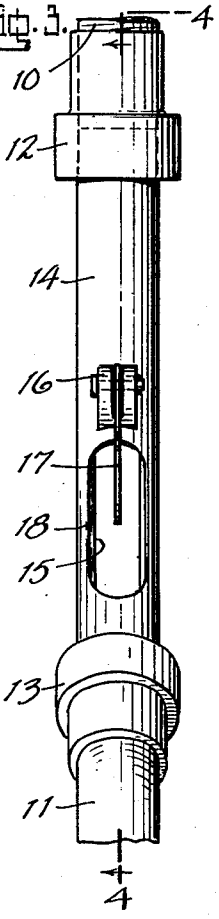


Fig. 4.

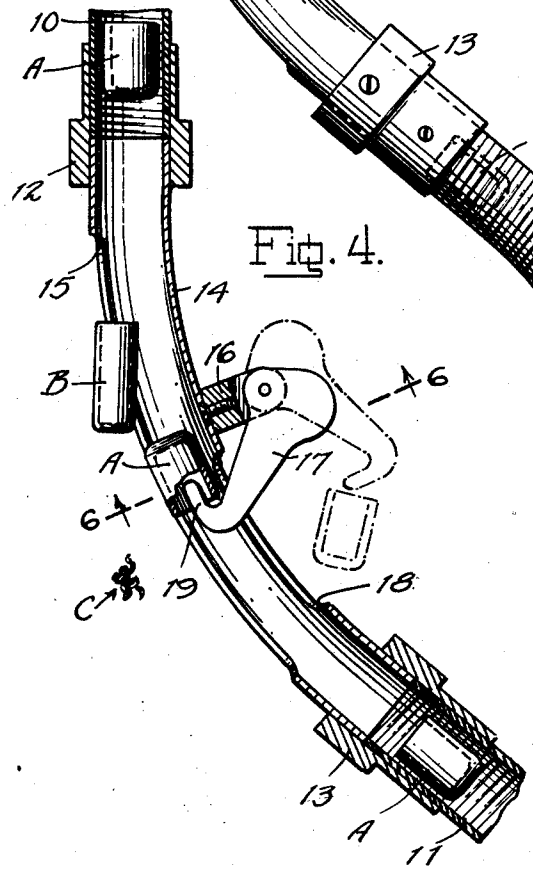


Fig. 5.

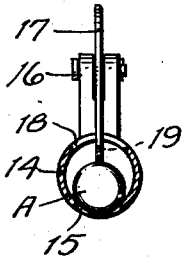
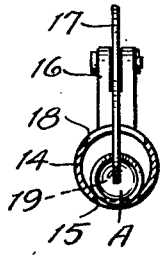


Fig. 6.



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ARTICLE ALIGNING DEVICE

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Application December 10, 1942, Serial No. 468,585

4 Claims. (Cl. 209—72)

The present invention relates to an article aligning device, and while the principles of the invention are adapted for aligning of any suitable type of cup-shaped articles, as will be obvious from the description, the illustrated disclosure is particularly directed to the feeding of bullet jackets from a hopper to a draw press or other suitable machine for operating upon the jacket at a given stage in its formation, the jacket contemplated in the illustrated disclosure being of cup-shape, following a preliminary draw operation thereon, and upon which further draw or finishing operations are to be performed to shape the cup member into pointed bullet jacket form.

These cup members are fed into the draw press with the open end up and are positioned in a draw die to be engaged at their open end by a draw punch, so that it is extremely important that the cups be fed in their proper position, otherwise smash-ups and other serious damage will result. Such damage is especially severe in the case of a die and punch designed to enter the open end of a cup member, as an inverted cup member will cause the punch to engage the closed end of the cup mashing it into the top of the die opening and invariably resulting in jamming and breakage, with production delay and costly tool replacement. Other principal causes of jams are foreign matter or scrap, and off-sized jackets or mixed work, that is jackets of inadequate size, or jackets produced by another operation and unintentionally mixed in the hopper. While devices are associated with the hopper for arranging the jackets for delivery in the proper position, a jacket will occasionally enter the tube in an inverted position, and such devices do not effectually prevent off-sized jackets and foreign matter or scrap from entering the feed tube.

It is an object of the invention to provide an article aligning device incorporated in a feed tube, which will permit the uninterrupted feed of cup-shaped articles, such as bullet jackets, as long as they are of the proper size and are disposed open end up in the feed tube, and which is adapted to engage and divert from the feed tube an article having its open end down.

Another object of the invention is to provide means whereby the feed tube will selectively feed only cup-shaped articles of the proper diameter, and will divert from the feed tube undersized articles and foreign matter or scrap.

A further object of the invention is to provide an article aligning device which is entirely automatic in operation so that it will function without the attention of the operator.

With the above and other objects in view, an embodiment of the invention is shown in the accompanying drawing, and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawing:

Fig. 1 is a side elevation of the article aligning device for feeding cup-shaped bullet jackets, according to the illustrated exemplary embodiment of the invention, the dot-and-dash lines showing the position of the movable article diverting means as it is engaged by a bullet jacket flowing through the feed tube in proper position with its open end up.

Fig. 2 is a rear elevation showing the under side of the feed tube.

Fig. 3 is a front elevation showing the upper side of the feed tube.

Fig. 4 is a vertical sectional view, taken along the line 4—4 of Fig. 3, showing an inverted jacket engaged by the movable article diverting means, showing in dot-and-dash lines the moved position and the diverted jacket, and further showing the diversion of an undersized jacket and scrap from the feed tube.

Fig. 5 is a transverse sectional view, taken along the line 5—5 of Fig. 1, and showing a bullet jacket in its normal open end up position engaged with the movable article diverting member in a position corresponding to the dot-and-dash line position illustrated in Fig. 1.

Fig. 6 is a transverse sectional view, taken along the line 6—6 of Fig. 4, and showing an inverted jacket engaged by the diverting member in a position corresponding to the full line position in Fig. 4.

Similar reference characters indicate corresponding parts throughout the several figures of the drawing.

Referring to the drawing, the article aligning device, according to the illustrated exemplary embodiment of the invention, is interposed between the upper and lower flexible feed tube sections 10 and 11, the upper section 10 being extended from the hopper or other suitable article supplying means, connected at its upper mouth end, and the lower section 11 being extended to the draw press or other suitable machine, connected at its lower outlet end, for performing a drawing or other desired operation individually upon the successively fed articles. To the lower end of the upper section 10 and the upper end

of the lower section 11 there is connected by means of coupling members 12 and 13 a curved rigid tube 14 corresponding in interior diameter to the flexible feed tube sections, having its upper end vertically aligned with the vertically disposed lower end to the upper section 10, the curvature of the tube 14 being such as to dispose its lower portion in offset relation to the vertical axis of the upper section 10, the curvature being at the same time upon a sufficiently large radius that the articles will have free gravity feed downwardly therethrough. The interior diameter of the feed tube is sufficiently larger than the diameter of the normal cup-shaped article, such as the illustrated bullet jacket A, that the latter will flow freely through it without turning over into inverted position.

In the under side of the tube 14 there is provided a slot 15, extending from a point near the end of its upper vertical end portion engaged with the coupling 12 to a point near its lower end engaged with the coupling 13, so that the lower end portion of the slot is substantially offset from the vertical drop line of the axis of the upper feed tube section 10 and the upper end of the tube 14, the width of this slot being slightly less than the diameter of the normal bullet jacket, so that the latter will not fall therethrough but will feed downwardly through the tube. The slot is sufficiently wide, however, to permit the passage therethrough of undersized jackets B and of foreign matter and scrap C, as shown in Fig. 4, these falling by gravity through the slot to a suitable recetpacle, before they can reach the lower feed tube section 11.

Upon the upper side of the tube 14 there is pivotally mounted in a bracket 16 a counter-balanced article diverting trigger-like arm member 17, extending through a slot 18 in the upper side of the tube below the bracket 16, and provided at its lower end with a hook portion 19, disposed in the normal counter-balanced position of the arm in upwardly projecting relation substantially axially of the tube, so that it is in the path of the open end of a jacket cup moving down the tube in inverted position. The upwardly directed end of the hook portion 19 is clear of the vertical drop line of the upper feed tube 10, so that falling scrap or undersized articles are not engaged thereby. The width of the slot 18 is slightly greater than the diameter of the normal bullet jacket A, so as to permit the free outward passage therethrough of an inverted article when the latter is diverted from the feed line by the member 17, as will presently more fully appear.

In operation, the succession of cup-shaped bullet jackets A of normal size flows through the tube 14 in uninterrupted flight, as long as the jackets are disposed in their proper position with the head end down and the open end up, as shown in Fig. 1, the trigger-like counter-balanced arm member 17 being swung clear of the path of the articles through engagement of their closed ends with the hook end 19, which engages the sides of the articles as they pass freely down the tube, as shown in dot-and-dash lines in Fig. 1. At the same time, any undersized jackets B, of insufficient diameter to meet the tolerance limits of acceptable jackets, and foreign matter or scrap C, drop substantially vertically through the slot 15 into a suitable receptacle, without coming into contact with the arm member 17.

In case a normal jacket A is disposed in the feed tube in inverted position with its open end down, the hook end 19 of the arm member 17 will enter the open end of the jacket, and the weight of the jacket and its momentum will cause the arm member to swing outwardly through the slot 18 carrying the inverted jacket with it to a point where the jacket drops off the hook end 19, falling into a suitable receptacle outside the feed tube, the counter-balanced arm immediately swinging back into its position within the feed tube to cooperate with the following jacket.

The form of the invention illustrated in the drawing and described herein is typical and illustrative only, and it is evident that the invention is capable of embodiments in other forms, all falling within the scope of the appended claims.

What is claimed is:

1. In a feed device, for articles having one end open and the other end of different structural form, an article conveying means adapted to receive and convey said articles in successive end-to-end relation, and pivotally mounted counter-balanced article entering means associated with said conveying means having a hook end portion normally disposed in the path of the open ends of said articles and movable out of said path, said hook end portion being constructed and arranged to enter an inverted open-end-forward article being fed through said conveying means and divert said open end forward article from said conveying means through overbalanced movement of said counter-balanced article entering means.

2. In a feed device, for articles having one end open and the other end of different structural form, an inclined gravity feed article conveying tube means adapted to receive and convey said articles in successive end-to-end relation, said tube means having a restricted opening in its upper side through which said articles can pass, pivotally mounted counter-balanced article entering means associated with said conveying means extending through said opening and having a hook end portion normally disposed in the path of the open ends of said articles and movable through said opening out of said path, said hook end portion being constructed and arranged to enter an inverted open-end-forward article being fed through said conveying means, and divert said open end forward article through said opening from said conveying tube through overbalanced movement of said counter-balanced article entering means.

3. In a feed device, for cylindrical cup-shaped articles having an open and a closed end, a gravity feed article conveying tube means including an upper substantially vertical drop section, a lower section downwardly spaced and laterally offset from said upper section, and an intermediate inclined section connected between said upper and lower sections, said intermediate section having in its lower side a longitudinally extending slot disposed at its upper portion in vertical line with the vertical drop line of said upper tube section and being less in width than the diameter of the normal sized articles to be fed through said tube, whereby normal sized articles will feed from said inclined section to said lower section and undersized articles and scrap will drop through said slot, said inclined section having in its upper side a slot greater in width than the diameter of said normal sized articles, a movable article entering means associated with said inclined tube section extending through said opening in the upper side of said section and normally disposed in the path of the open ends of said articles being fed and movable through said opening out of said path,

whereby an inverted open-end-forward article being fed is engaged by said article entering means and diverted from said inclined tube section through said opening through movement of said article entering means.

4. In a feed device for bullet jacket members having an open end and a closed end; a jacket conveying tube adapted to receive and carry jackets therethrough in end-to-end relationship, said tube having an aperture in the wall thereof; and a counterbalanced jacket separating means pivoted to said tube opposite said aperture and adapted normally to be held in the path of the jackets being conveyed through said tube by the weight of the counterbalance and to be swung out of said path through said aperture by the force of a jacket striking said separating means, said jacket separating means being constructed and arranged to engage in the open end of an inverted jacket and to carry said jacket out through said tube aperture thereby to separate the inverted jackets from the noninverted jackets.

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