

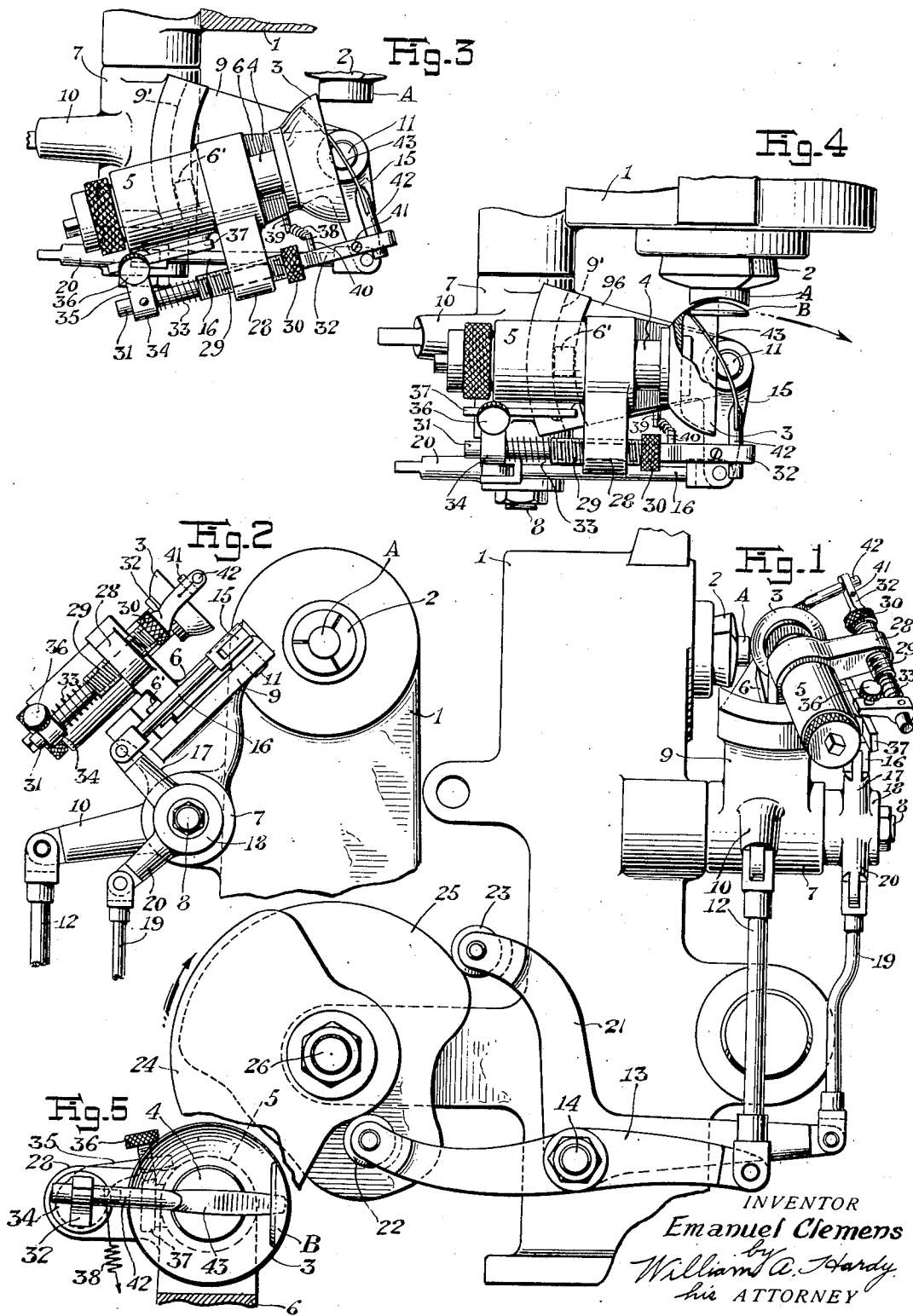
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MACHINE FOR MAKING BUTTONS AND LIKE ARTICLES

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MACHINE FOR MAKING BUTTONS AND  
LIKE ARTICLES

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9 Claims. (Cl. 79—1)

My invention relates to machines for making buttons and like articles and more particularly to machines designed to automatically and successively sever or form and sever such articles from rods of suitable material.

While for purposes of illustration, I have shown in the drawing of this application and shall hereinafter specifically describe, a preferred embodiment of my invention applied to a machine generally similar in construction to that disclosed in Patent No. 1,843,944, granted to me on February 9, 1932, it is to be understood that my invention is capable of being expressed in a great variety of mechanical forms and is also adapted for application to many other differently constructed machines.

In the operation of a machine of the general character of that disclosed in said Patent No. 1,843,944, a rod of uncured casein material or other material, is rapidly rotated as buttons are successively formed and severed therefrom. The buttons are also usually severed from the rod by either a driven or freely rotatable cutter which rotates at a high speed during the severing operation. Under such conditions the buttons as they are produced from the rod, are projected or fly from the point of severance in a haphazard manner in various directions and at various velocities. Consequently it has heretofore been very troublesome to collect or accumulate the buttons as they are produced by and discharged from a machine of the type referred to.

The principal object of my invention is to provide in such a machine an improved construction and arrangement whereby the buttons as they are produced by and discharged from the machine, may be readily collected and amassed at a desired location.

Another object of my invention is to provide a construction whereby the buttons as they are produced will be projected from the machine in a definite predetermined path.

A further object of my invention is to provide means adjustable to vary the velocity at which the buttons are discharged from the machine, such means also preferably being adjustable to vary the direction in which the buttons are discharged.

Other objects and features of my invention will be set forth in the following description and the appended claims.

For a clearer understanding of my invention, attention is directed to the drawing which accompanies and forms part of this specification, and in which:

Figure 1 is a view in side elevation, partly broken away, of a button making machine equipped with a preferred embodiment of my invention;

Fig. 2 is a fragmentary elevational view looking from the right of Fig. 1;

Fig. 3 is an enlarged fragmental plan view of the machine showing the cutter and certain associated parts in the positions they occupy at the beginning of a button severing operation;

Fig. 4 is a view similar to Fig. 3 but with the cutter and associated parts shown in the positions they occupy at the conclusion of a button severing operation; and

Fig. 5 is a view of the cutter and button ejecting means, looking from the right of Fig. 4.

The machine shown, except for the button ejecting means, is generally similar in construction and operation to that shown and described in Patent No. 1,843,944, referred to above. It comprises a frame 1 in the upper part of which a releasable chuck 2 for the rod A of uncured casein or other material is rotatably mounted, the chuck being rotated at high speed when the machine is in operation, by suitable driving means (not shown).

Intermittently and during the periods between the production of successive buttons from rod A, chuck 2 is released and the rod is fed forwardly therein uniform amounts to present sections to be formed into buttons. The means for controlling the chuck and feeding the rod there-through are not shown herein, the same being clearly disclosed in my aforementioned Patent No. 1,843,944 and my Patent No. 1,819,811, granted August 18, 1931. After each feeding movement of rod A, the forward end thereof is preferably first engaged and operated upon by a button facing tool (not shown), the facing tool and means for actuating the same being described in my above mentioned Patent No. 1,819,811; and the rod is then engaged and operated upon by a tool which cuts and forms the rear face of the button and finally severs the formed button from the rod.

The tool for cutting and forming the rear faces of the buttons and for severing the formed buttons from the rod A and the actuating mechanism for said tool are quite similar to those shown and described in my aforesaid Patent No. 1,843,944. The tool itself is a circular and preferably also a cup-shaped cutter 3 and is secured centrally of the bottom thereof to one end of a short shaft 4 which is mounted for free rotation in a bearing 5 provided on a bracket 6.

A rocker 7 is pivotally mounted at 8 on frame 1 for swinging movement about an axis which is parallel to the axis of the chuck 2, said rocker comprising an upper arm 9 and a lower arm 10. The bracket 6 is pivotally connected at 11 to the rocker arm 9 for swinging movement about an axis which preferably extends through the spherical center of the cutter 3 and at right angles to the axis of rotation of the latter. The rocker

arm 9 is provided adjacent its inner end with an upstanding segmental flange having an arcuate slot or groove 9' which is engaged fairly closely by a roller 6' carried by the bracket, this construction serving to guide and support said bracket in the movement thereof about the pivot 11. A vertical link 12 is pivotally connected at its upper end to the rocker arm 10 and at its lower end to one end of a lever 13 which is pivotally mounted at 14 on the frame 1.

The bracket 6 has a laterally extending arm 15 which is pivotally connected to one end of a link 16, the other end of such link being pivotally connected to one arm 17 of a bell crank lever 18. A vertical link 19 is pivotally connected at its upper end to the other arm 20 of the bell crank 18 and at its lower end to a bell crank lever 21 pivotally mounted at 14 on the frame 1.

The levers 13 and 21 are respectively provided at the ends thereof remote from the links 12 and 19, with rollers 22 and 23 which respectively ride on the surfaces of cams 24 and 25. These cams are secured to a shaft 26 which is journaled in frame 1 and which is actuated by suitable driving means (not shown). The rollers 22 and 23 are at all times respectively maintained in engagement with the cams 24 and 25 by suitable springs (not shown) respectively acting on the two linkage and lever systems above described.

In each rotation of the shaft 26, the cutter 3 and the mechanism associated therewith are actuated to cause the cutter to engage and cut the rod A to form the rear face of a button and to sever the formed button from the rod; the cycle of operations for a complete rotation of shaft 26, starting with the parts in the positions shown in Figs. 1 and 2, being briefly as follows: The cam 24, through lever 13 and link 12, first swings the rocker 7 about its pivot 8 to move the rocker arm 9 and cutter shaft 4 from the inclined positions in which they are shown in Figs. 1 and 2 to horizontal positions and to thereby bring the freely rotatable cup-shaped cutter 3 into operative cutting position with respect to rod A, as shown in Fig. 3. In the continued rotary movement of shaft 26 the rocker arm 9 remains stationary in horizontal position while the cam 25, through lever 21, link 19, bell crank lever 18 and link 16, first moves bracket 6 in one direction on the rocker arm 9 about the pivot 11 from the position shown in Fig. 3 to that shown in Fig. 4, thereby causing the cutter to cut rod A to form the rear face of the button and to sever the formed button from the rod, and then moves said bracket about pivot 11 in the opposite direction thereby retracting the cutter and returning the same and the bracket to the position of Fig. 3. The freely rotatable cutter in moving to the position shown in Fig. 4 is rotated by the rapidly rotating rod A at proper speeds to cut the rear face of the button without tearing or smearing the same. During the further movement of shaft 26 necessary to complete a single rotation thereof, the cams 24 and 25 act to return the cutter and associated parts to the positions shown in Figs. 1 and 2.

I shall now describe the illustrated form of the means whereby the buttons as they are severed from the rod A, are each ejected from the machine in a definite desired path to enable the same to be readily collected or amassed. That portion of bracket 6 which forms the bearing 5 is provided with a lateral projection or arm 28 through which a screw 29 having a knurled head

30 is threaded. The screw 29, which is parallel to the shaft 4 of cutter 3, has an axial opening through which a generally cylindrical rod 31 extends, this rod being mounted for slidable and angular movements in said opening. The right-hand or inner end portion 32 of rod 31 is flat and is shouldered where it joins the main cylindrical portion of the rod, and a coiled compression spring 33 disposed on the left-hand or outer end portion of the rod between the screw 29 and a collar 34 secured, as by a set-screw, to the rod tends to maintain the latter constantly in that position lengthwise of the screw in which the shoulder of its said end portion 32 engages the head 30 of the screw. The collar 34 has a laterally extending arm 35 through which extends a screw 36 having a knurled head, the inner or lower end of this screw being adapted to engage and ride on a straight-edge guide or way 37 provided on the bearing 5 of bracket 6. A tension spring 38 secured at one end to a pin 39 on bracket 6 and at its other end to a pin 40 on the end portion 32 of rod 31, constantly tends to move the rod about its axis so as to maintain the lower end of screw 36 engaged with the way 37. The inner end of the rod 31 is split and provided with an adjustable clamping screw 41 whereby a short rod 42 is removably and adjustably secured therein. The rod 42 extends substantially at right angles from rod 31, and fixedly secured at one end to rod 42 and extending therefrom transversely of the open end of the cup-shaped cutter 3 is a flat resilient arm 43. This arm preferably curves somewhat towards the cutter and terminates at its free end a slight distance from a point on the inner surface of the cutter which is substantially diametrically opposite to that point of the cutter which is nearest the rod 31.

The button ejecting means just described operates as follows: Each time the cutter 3, during the operation of the machine, is moved from the position shown in Figs. 1 and 2 to that shown in Fig. 3, and from the latter position towards that shown in Fig. 4, the free end of arm 43 is engaged with that surface portion of rod A which constitutes the edge of the portion or button B about to be severed from the rod, and as the movement of the cutter progresses, the arm 43 by reason of its said engagement with the rod, is flexed and forced inwardly of the cutter. When the article or button B is finally severed from the rod, the pressure on the arm 43 is released and the latter immediately springs back to its original form and suddenly exerts a deflecting force on the severed article or button to propel or eject the same from the machine at a high velocity in a lateral direction with respect to the rod A. For a given adjustment of the arm 43, each button as it is severed from the rod will be propelled or ejected from the machine in a definite predetermined path, and the buttons as they are produced, may accordingly readily be collected in a suitable receptacle or otherwise.

The predetermined path in which the buttons are thus ejected from the machine may be varied within fairly wide limits, by varying either the direction or the amount or both the direction and the amount of the deflecting force applied to the buttons, as they are severed, by the resilient arm 43. The direction of such deflecting force may be regulated merely by adjusting the arm 43 about the axis of rod 31 transversely of the axis of rotation of the cutter between positions at either side thereof, this adjustment being effected merely by turning the screw 36 in one

direction or the other; while the amount of the deflecting force may be regulated by adjusting the rod 42 and resilient arm 43 bodily in the direction of the axis of rotation of the cutter, this adjustment being effected by turning the screw 5 29 in one direction or the other.

The ejecting means is also readily adaptable for proper operation with cutters of various sizes by longitudinal adjustment of the rod 42 and arm 43 with respect to the inner end portion of rod 31 which constitutes a holder therefor.

Having now fully described my invention, I claim:

1. A machine for producing articles from a rod, comprising a rod holder, a circular cutter for severing the articles from a rod in said holder, a support on which said cutter is mounted for rotation about its central axis, means for moving said support alternately in opposite directions to thereby bodily move the cutter toward and from the rod, and a resilient device secured to said support so as to move therewith and partake of the said bodily movements only of the cutter, said device being so disposed with respect to the cutter that it will engage only that portion of the rod which is to be formed into such an article as the same is being severed from the rod by the cutter.

2. A machine for producing articles from a rod, comprising a rod holder, a circular cutter having a peripheral cutting edge portion for severing the articles from a rod in said holder, a support on which said cutter is mounted for rotation about its central axis, means for moving said support alternately in opposite directions to thereby bodily move the cutter toward and from the rod, and a resilient device secured to said support so as to move therewith and partake of the said bodily movements only of the cutter, said device having a portion disposed adjacent to but spaced a slight distance radially inward from the cutting edge of the cutter whereby in the severing of the article from the rod by the cutter said portion will engage such article only and at the edge thereof to thereby exert thereon a deflecting force.

3. A machine for producing articles from a rod, comprising a rotatable rod holder, a circular cutter for severing the articles from a rod in said holder, a support on which said cutter is mounted for free rotation, means for moving said support in opposite directions to thereby bodily move the cutter toward and from the rod, a device mounted on said support so as to move therewith and partake of the said bodily movements only of the cutter, said device being so disposed with respect to the cutter that it will engage and exert a deflecting force on such an article as the latter is being severed from the rod by the cutter, and means for adjusting said device in two directions whereby both the direction in which such force is exerted and the amount of such force exerted at the conclusion of the severing operation may be varied.

4. A machine for producing button-like articles from a rod, comprising a circular cutter having a peripheral cutting edge portion for severing such articles from the rod, a support on which said cutter is mounted for rotary movement, means to move said cutter alternately in opposite directions thereby to shift the cutter to and from operative cutting position relatively to the rod,

and a resilient arm secured to said support, said arm when the support is moved to bring the cutter into engagement with the rod, being engaged with the edge of that portion only which is about to be severed from the rod and thereby being stressed.

5. A machine for making button-hole articles from rods, comprising a rotatable chuck for supporting such a rod, a cup-shaped cutter, a support on which said cutter is rotatable, said support being pivotally movable to thereby move the cutter to and from cutting engagement with a rod held in said chuck, and a resilient member carried by said support and extending transversely of the larger end of the cutter, said member having a free end terminating adjacent and inwardly of the cutting edge of the cutter.

6. A machine for making button-like articles from rods, comprising a rotatable chuck for supporting such a rod, a circular cutter having a peripheral cutting edge, a support on which said cutter is freely rotatable, means to move said support in opposite directions to thereby move the cutter to and from cutting engagement with a rod held in said chuck, and a resilient member carried by said support and extending transversely of the cutter, said member having a free end disposed adjacent but inwardly of the cutting edge of the cutter, said member being adjustable in the direction of the axis of rotation of the cutter.

7. A machine for making button-like articles from rods, comprising a rotatable chuck for supporting such a rod, a cup-shaped cutter, a support on which said cutter is rotatable, said support being pivotally movable to thereby move the cutter to and from cutting engagement with a rod held in said chuck, and a resilient member carried by said support and extending transversely of the larger end of the cutter, said member having a free end disposed adjacent but inwardly of the cutting edge of the cutter, said member being adjustable toward and away from the axis of rotation of the cutter.

8. A machine for making button-like articles from rods, comprising a rotatable chuck for supporting such a rod, a cup-shaped cutter, a support on which said cutter is rotatable, said support being pivotally movable to thereby move the cutter to and from cutting engagement with a rod held in said chuck, and a resilient member carried by said support and extending transversely of the larger end of the cutter, said member having a free end disposed adjacent but inwardly of the cutting edge of the cutter, said member being adjustable in the direction of the axis of rotation of the cutter and also transversely of said axis between positions at either side thereof.

9. A machine for making button-like articles from rods, comprising a rotatable chuck for supporting such a rod, a circular cutter having a peripheral cutting edge, a support on which said cutter is rotatable about an axis passing through the center of the cutter, means to move said support to thereby move the cutter to and from cutting engagement with a rod held in said chuck, and a resilient member carried by said support and extending transversely of the cutter, said member having a free end disposed adjacent but inwardly of the cutting edge of the cutter.

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