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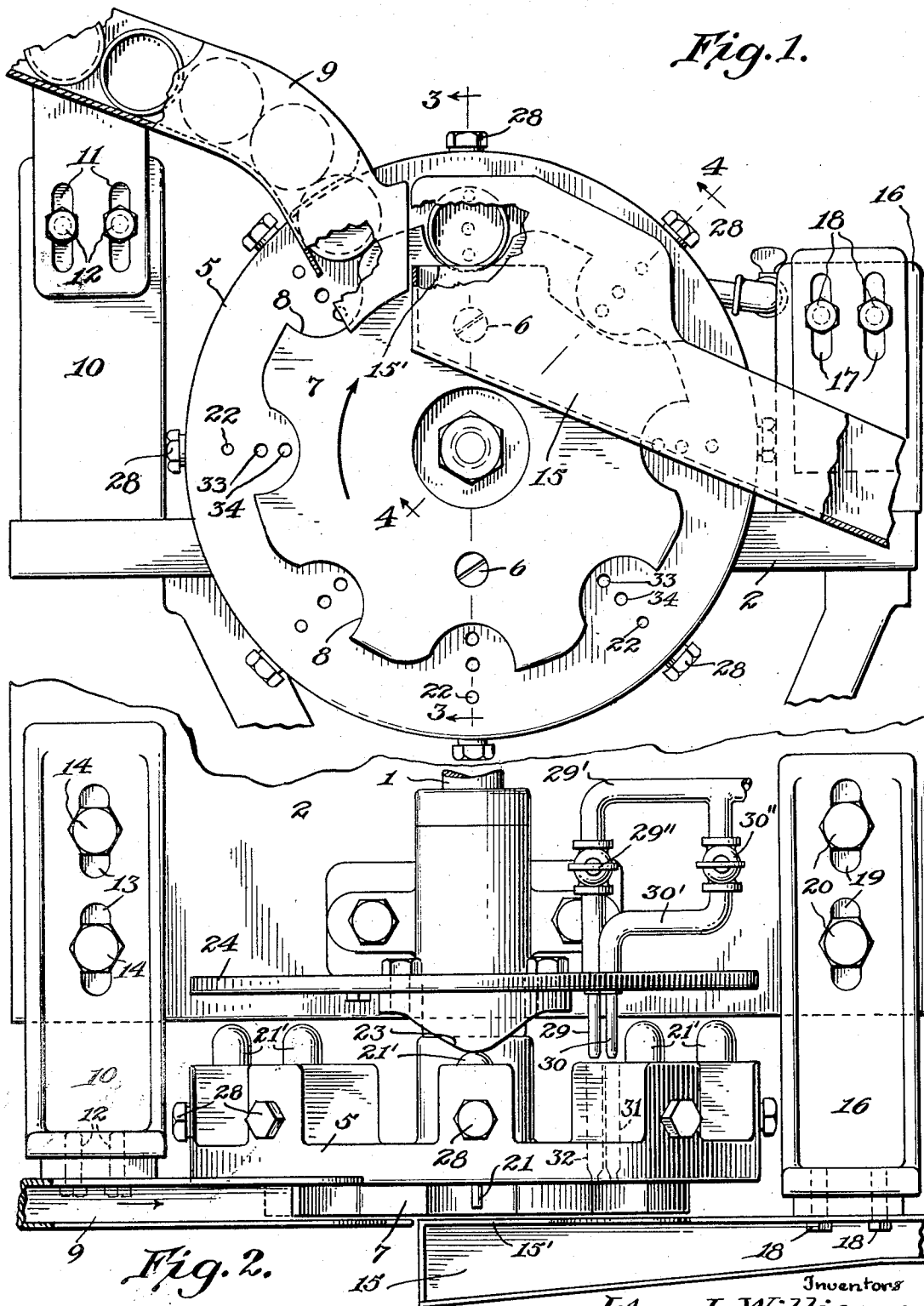
J. J. WILLIAMS ET AL

2,023,561

BLANK ARRANGING MECHANISM

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2 Sheets-Sheet 1



Inventors
John J. Williams
Joseph Bauman
Cushman & Cushman
Attorneys

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2 Sheets-Sheet 2

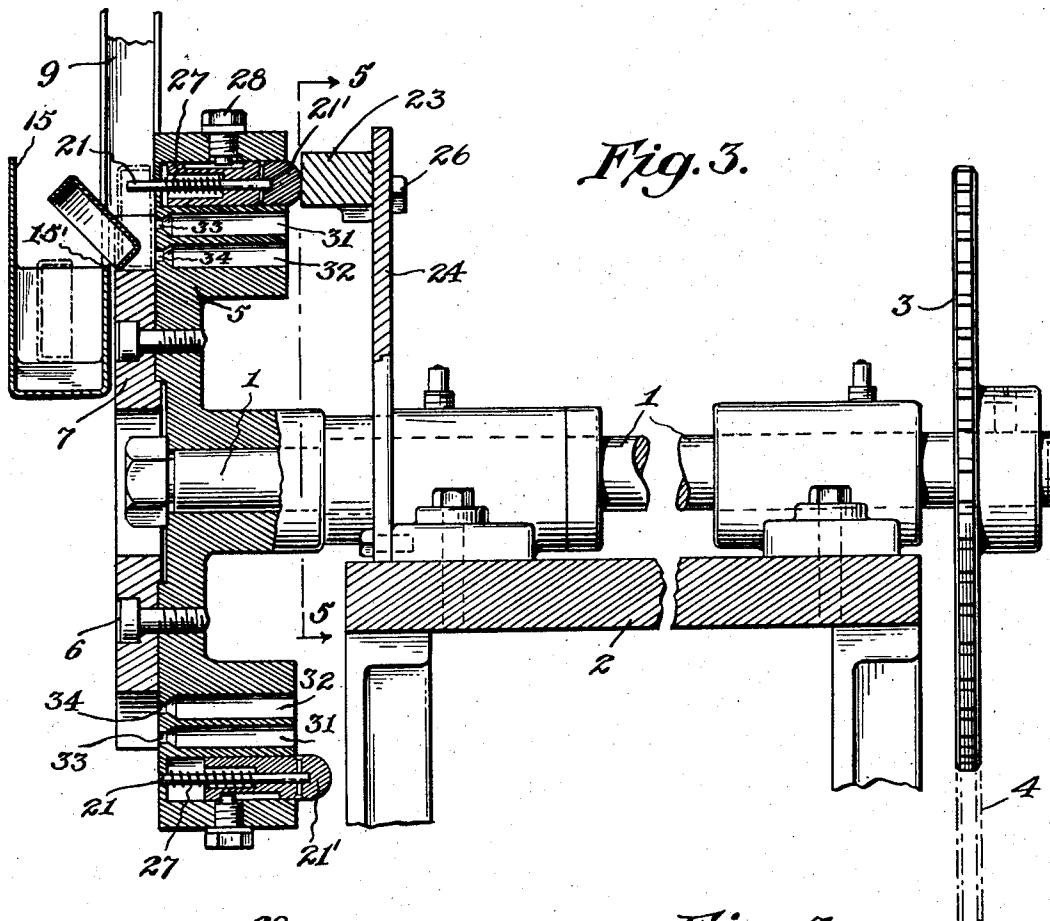


Fig. 3.

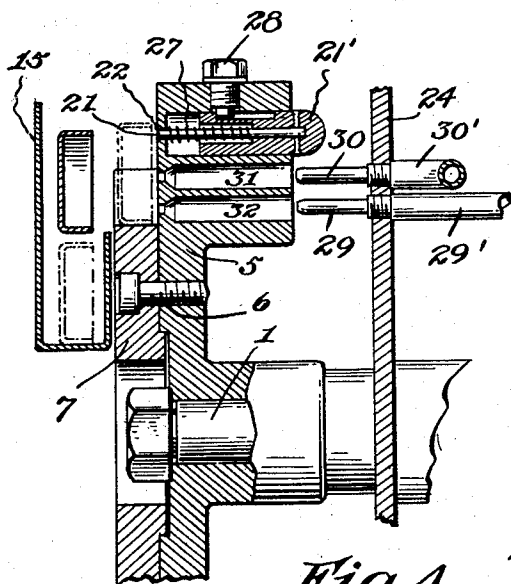


Fig. 4.

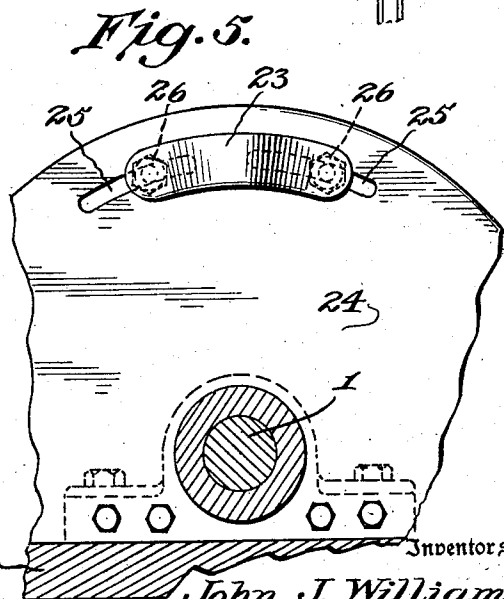


Fig. 5.

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Inventors
John J. Williams
Joseph Bauman
Charles H. Bauman
Attorneys

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BLANK ARRANGING MECHANISM

John J. Williams and Joseph Bauman, Wheeling,
W. Va., assignors to Hazel-Atlas Glass Com-
pany, Wheeling, W. Va., a corporation of West
Virginia

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In the manufacture of metallic caps the blanks are formed on one machine, and these blanks are subsequently delivered to one or more machines for performing such operations as threading, beading and curling. When the blanks are delivered from the forming dies to a conveyer or chute it is practically impossible to deliver all of them facing in the same direction, particularly small blanks. The object of the present invention is to provide a simple and inexpensive device which will rapidly and efficiently cause all of the blanks to face in the same direction in passing from any point of reception to any point of delivery.

The various advantages of the invention will be apparent to those skilled in the art from the following detailed description, when taken in connection with the accompanying drawings; in which,

Figure 1 is a front view of the apparatus, parts being broken away to more clearly show the construction.

Figure 2 is a plan view of the apparatus.

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 1.

Figure 4 is a fragmentary transverse sectional view taken on line 4—4 of Figure 1; and

Figure 5 is a fragmentary vertical sectional view taken on line 5—5 of Figure 3.

Referring to the drawings in more detail, numeral 1 indicates a shaft suitably mounted upon a base plate 2. This shaft is continuously rotated by any desired means, as by a sprocket wheel 3 driven by a chain 4 from any preferred source of power.

Numeral 5 refers to a wheel mounted on the shaft 1 to continuously rotate therewith, and this wheel carries means for acting on the blanks. Such means and the mode of operation will be described hereinafter. Detachably mounted on the face of the wheel 5, as by screws 6, 6, is a holder disk 7 for transporting the blanks while they are being acted upon. The periphery of this disk or holder is provided with a plurality of pockets 8; in this particular machine eight of such pockets being provided. These pockets are designed to suit the particular blanks being handled.

Numeral 9 refers to a chute leading from the forming dies or from any other point where the blanks are received; and by reference to Figure 1 it will be noted that the blanks are not all facing in the same direction in the chute. The lower end of the chute is in alignment with the holder disk 7, and as the blanks reach the continuously

revolving holder they are successively received in the pockets 8; the blanks indiscriminately facing in either direction when positioned in the pockets. The machine is used for orienting blanks of different diameters and of different depths, and different holders 7 are preferably used when blanks of materially different size are being treated. For that reason, and also for the original setting of the chute with the holder, it is desirable that the chute 9 be adjustable. For this purpose the lower end of the chute is mounted for vertical adjustment on a bracket 10, as by means of the slots 11 and bolts 12. And the bracket 10 is mounted on the base plate 1 for forward and backward adjustment, as by means of the slots 13 and bolts 14. Thus the lower end of the chute can be accurately adjusted with respect to the holder 7 and wheel 5.

A second chute, referred to by the numeral 15, and independent of the chute 9, is positioned adjacent the holder 7 to receive the blanks when they are delivered from the holder. In the specific form illustrated the part of this chute adjacent the holder is wider than the chute 9, for some of the blanks are to be toppled over into the chute, as illustrated in Figure 3. The chute is gradually narrowed away from the holder disk. It will be noted that the chute is designed to cooperate with the pockets 8 from their top position to a point some little distance to the right (Fig. 1), for in the specific form illustrated the blanks are ejected either at the top or shortly after passing the top, depending upon the direction in which the blanks face; though it will be understood that the operations could be performed at other positions, if preferred. This chute 15 is also preferably adjustable with respect to the holder 7 and wheel 5. To secure the desired adjustments the upper end of the chute is mounted for vertical adjustment on a bracket 16, as by means of slots 17 and bolts 18; and the bracket 16 is mounted on the base plate 2 for forward and backward adjustment, as by means of slots 19 and bolts 20.

The means for orienting the blanks during the continuous rotation of the wheel 5 and holder 7, will now be described. A plurality of feelers or plungers 21 are slidably mounted in the wheel 5; there being eight of these plungers or feelers in the specific form illustrated, one of them being associated with each of the pockets 8. In the specific form shown the feelers are attached to reciprocable head 21'. When the feelers are projected forward they extend through openings 22 in the face of wheel 5 into the pockets 8. The

feelers are successively projected forward when they reach a predetermined position; which in the form illustrated is at the top of their circular path of travel. A stationary cam 23 is provided for successively projecting each feeler forward, and this cam is preferably mounted for adjustment on a cam plate 24, as by means of slots 25 and bolts 26. The cam plate is mounted on the bed plate 2, and if desired it may be mounted for adjustment backward and forward.

In the specific construction illustrated the feelers are snapped back after leaving the cam 23 by means of springs 27, and the rearward movement is limited by stop screws 28. The feelers or plungers remain in the retracted position until they again reach the cam 23. By reference to Figure 3 it will be noted that the inner wall of the chute 15 is so designed that it projects slightly above the bottoms of the pockets when the pockets are at the top of their circular path, as indicated by numeral 15'. This construction assists in toppling over the blanks, as will appear more fully hereinafter.

Blanks which face in one direction are ejected and toppled over by the plunger when the particular pocket is at the top of its circular path; but blanks facing in the opposite direction are in no way affected by the action of the plunger, and are carried forward and ejected by air pressure, in this particular form, without being toppled over. Of course the air under pressure may be delivered at any desired point; but in the present form, two air nozzles 29, 30, are mounted on the cam plate 24 slightly to the right (Fig. 2) of the cam 23. Air under pressure is constantly supplied to these nozzles 29 and 30, by pipes 29' and 30', connected with any desired source of compressed air, or other fluid pressure. The pipes 29' and 30' are preferably provided with valves 29'' and 30'', to control the flow of the air or other fluid under pressure. The wheel 5 is provided with a plurality of sets of air passages, there being one set for each pocket 8 in the holder, and in the specific form illustrated there are two passages 31 and 32 in each set, to cooperate with the two nozzles 29 and 30. It will be understood that a single nozzle may be employed, if desired, and in such event there would be only one passage associated with each pocket; or if preferred more than two of the nozzles and passages could be employed. In the particular construction illustrated the passages 31 and 32 are tapered at their outlet ends so that the compressed air is discharged through relatively small outlet ports 33 and 34.

The following brief description of the operation of the apparatus will refer particularly to the orienting of blanks for caps, but it will be understood that the invention is equally well adaptable to the orienting of completed caps wherever such operation is desirable. The wheel 5 and the blank holder 7 are turning continuously to the right, as indicated by the arrow in Figure 1; and the blanks are continuously fed to and positioned in the pockets 8 by means of the chute 9 or by any other desired means. When the blanks are received in the chute 9 they indiscriminately face in either of two directions and consequently they are indiscriminately facing in either direction when positioned in the pockets 8. As each pocket approaches the top of the path of rotation, the cam 23 projects the plunger or feeler 21 forwardly into its associated pocket. If the blank happens to be so positioned in the pocket that its open end is facing away from the plunger then

the plunger will strike the back (or top) of the blank and topple it over, as indicated in full lines in Figure 3. To assist in toppling over the blank the wall of the chute 15 is raised slightly above the bottom of the pockets 8 when the pockets are at the top of their circular path. This portion of the chute, indicated by numeral 15' on Figure 3, acts as an obstruction or baffle to hold the lower portion of the blank when the blank is struck by the plunger 21. While this is the preferred construction it will be understood that the invention is not limited to any such arrangement, as the blanks can be successfully toppled over without any obstructing means at the lower portions of the blanks. As the blank shown in full lines in Figure 3 falls over into the chute 15 it assumes the position indicated by dotted lines in the chute, with its open end facing to the right. The blank having been discharged, the pocket continues its travel until it again reaches the chute 9 and receives another blank; and of course the plunger or feeler 21 is retracted by the spring 27 as soon as the head 21' leaves the cam 23.

Let it now be assumed that the blank is positioned oppositely to that previously described, so that its open end faces to the right (Figure 3). In such event, when the pocket approaches the top of its travel the plunger or feeler will be projected forwardly as before, but as clearly shown in Fig. 3 it has no effect upon the blank, as the plunger does not project into the pocket far enough to strike the blank when the blank is positioned with its open end to the right. With a blank so positioned it is carried onward in its continuous travel until the air passage or passages in the wheel 5 come into alignment with the air nozzles. Air or other fluid under pressure is being constantly delivered from the nozzle or nozzles and when the passages are passing these nozzles the air under pressure will pass therethrough and strike the blank, as illustrated in Figure 4. By reference to that figure it will be apparent that the blank is blown from the pocket with its open end still facing to the right, as shown in full lines, and drops into the chute 15 still facing in the same direction, so that the blanks which are discharged by the air under pressure face in the same direction as the blanks which are toppled over by the plungers. Thus all of the blanks are properly oriented for delivery to another machine or for any other purpose.

We have described above one mode of operation of this machine. It will be apparent however that the machine is capable of operating in another manner without the use of the air pressure. In the description of such operation it will be assumed that the air lines and the passages 31 and 32 are omitted. In such a construction, when a blank with its open end facing to the left (Figure 3) reaches the top of its travel the plunger or feeler will topple it over just as described hereinbefore, so that when it falls into the chute 15 its open end will face to the right. If now another blank is positioned in a pocket with its open end facing to the right, the movement of the plunger will have no effect upon it, as also described hereinbefore, and such blank will be carried onward in its continuous travel. But in this machine no air pressure is employed to discharge it, and consequently the blank will be carried onward until it falls from the pocket by gravity into a branch of the same chute or into another chute (not shown), and which chute may lead into the chute 15. Thus the blanks which are

originally positioned with their open ends facing to the left (Figure 3) will be toppled over so that their open ends will face to the right; and blanks which were originally positioned with their open ends facing to the right will be discharged by gravity in such position. If two chutes are employed to receive the discharged blanks, one of the chutes may lead into the other, or the two chutes may separately deliver the oriented blanks

As mentioned hereinbefore, where caps of materially different diameters or materially different depths are being oriented, it is desirable to employ different holders 7; and in this connection attention is called to the fact that the holder may be removed merely by removing the bolts 6.

While the apparatus has been described in considerable detail, yet it is to be understood that many changes and modifications may be made without departing from the spirit of the invention, and all such changes and modifications are intended to be included within the scope of the appended claims.

What we claim is:

1. Apparatus for arranging blanks and the like, including continuously moving means for transporting a blank, and a reciprocable plunger operative during the continued movement of said means for ejecting said blank when it faces in one direction, said reciprocable plunger having no effect upon the blank when it faces in the opposite direction.

2. Apparatus for arranging blanks and the like, including movable means for transporting a blank in substantially a vertical plane, and means operative during the continued movement of the transporting means for ejecting a blank therefrom by fluid pressure without changing the direction in which the blank faces.

3. Apparatus for arranging blanks and the like, including means for holding a blank, a reciprocable plunger effective to eject blanks facing in one direction, and fluid pressure means effective to eject blanks facing in the opposite direction.

4. Apparatus for arranging blanks and the like, including a continuously rotating holder carrying blanks, and means for ejecting and reversing during ejection those blanks which face in a particular direction.

5. Apparatus for arranging blanks and the like, including a holder rotatable about a substantially horizontal axis and carrying blanks, and means operative during the continued rotation of said holder for successively blowing from said holder those blanks which face in a particular direction, said means being effective without changing the direction in which the blanks face.

6. Apparatus for arranging blanks and the like, including a continuously rotating holder carrying blanks, means operative during the continued rotation of said holder for ejecting therefrom blanks which face in a particular direction, and other means for ejecting from said holder blanks which face in the opposite direction.

7. Apparatus for arranging blanks and the like, including a continuously rotating holder carrying blanks, a reciprocable plunger operative during the continued rotation of said holder for successively ejecting from the holder blanks facing in a particular direction, said plunger being

ineffective to eject blanks facing in the opposite direction.

8. Apparatus for arranging blanks and the like, including a continuously rotating holder carrying the blanks, a reciprocable plunger for successively ejecting from the continuously rotating holder blanks facing in a particular direction, and means for subsequently discharging from the holder blanks facing in the opposite direction.

9. Apparatus for arranging blanks and the like, including a rotatable holder carrying the blanks, a reciprocable plunger for successively ejecting and capsizing blanks facing in a particular direction, and means for subsequently discharging from the holder blanks facing in the opposite direction.

10. Apparatus for arranging blanks and the like, including a rotatable holder carrying the blanks, a reciprocable plunger for successively ejecting and capsizing blanks facing in a particular direction, and means for ejecting without capsizing blanks facing in the opposite direction.

11. Apparatus for arranging blanks and the like, including a rotatable holder carrying the blanks, means for successively ejecting and capsizing blanks facing in a particular direction, and a fluid blast for ejecting without capsizing blanks facing in the opposite direction.

12. Apparatus for arranging blanks and the like, including a rotatable holder carrying the blanks, a reciprocable plunger for successively ejecting and capsizing blanks facing in a particular direction, and a fluid blast for ejecting without capsizing blanks facing in the opposite direction.

13. Apparatus for arranging blanks and the like, including a continuously revolving holder, having a plurality of pockets, means for feeding blanks to said pockets, a reciprocable plunger associated with each of said pockets and traveling with said holder, and means for successively projecting said plungers into the pockets, said plungers ejecting from said holder during the continuous rotation thereof the blanks facing in a particular direction, and said plungers being ineffective to eject blanks facing in the opposite direction.

14. Apparatus for arranging blanks and the like, including a continuously revolving holder having a plurality of pockets, means for feeding blanks to said pockets, a reciprocable plunger associated with each of said pockets and traveling with said holder, means for successively projecting said plungers into the pockets, said plungers ejecting and capsizing blanks facing in a particular direction, and means for ejecting without capsizing blanks facing in the opposite direction.

15. Apparatus for arranging blanks and the like, including a continuously revolving holder having a plurality of pockets, means for feeding blanks to said pockets, a reciprocable plunger associated with each of said pockets and traveling with said holder, means for successively projecting said plungers into the pockets, said plungers ejecting and capsizing blanks facing in a particular direction, and a fluid blast for ejecting without capsizing blanks facing in the opposite direction.

JOHN J. WILLIAMS.
JOSEPH BAUMAN.