Dec. 19, 1950 C. EISLER 2,534,547

MACHINE FOR CRACKING AND FLARING BLANKS

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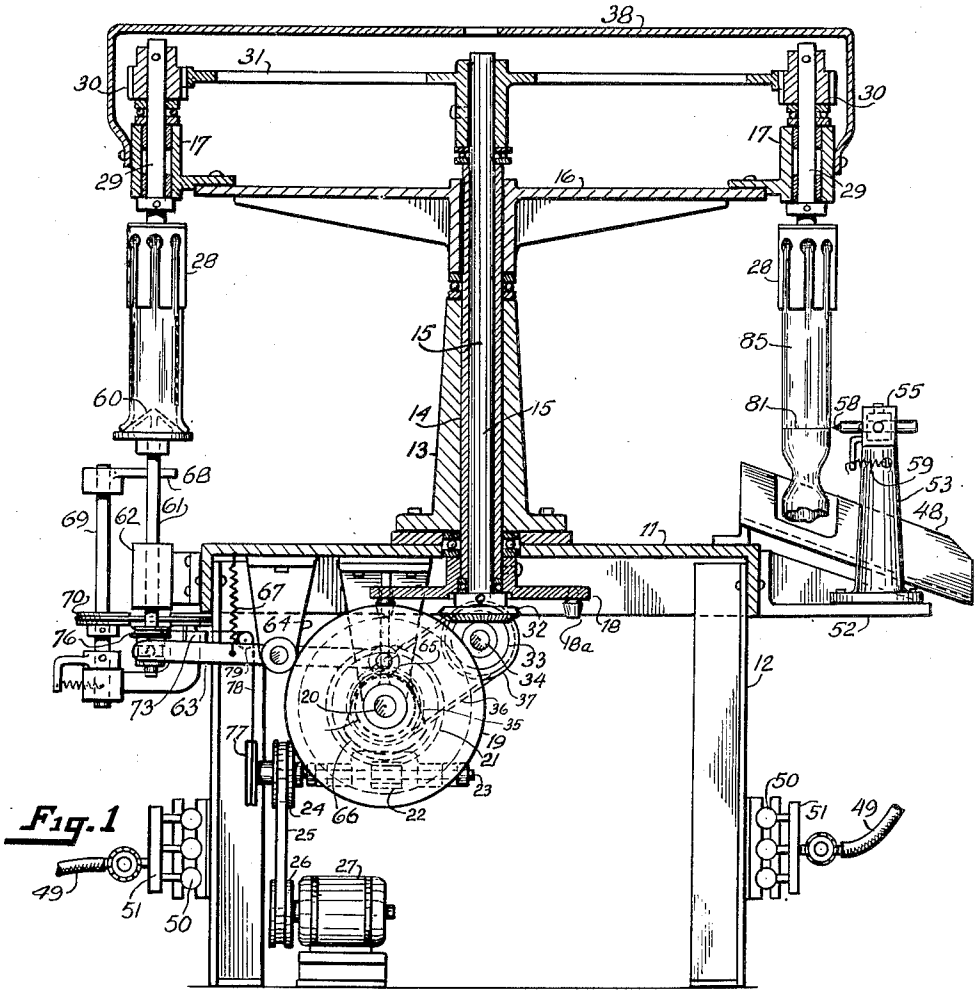


Fig. 1

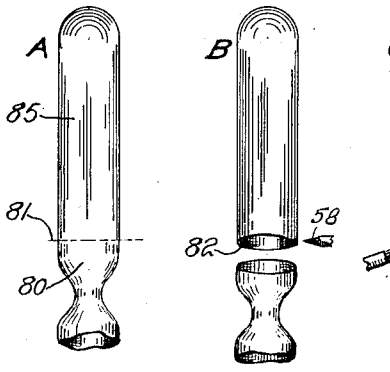


Fig. 3

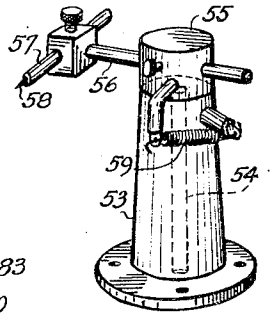


Fig. 4

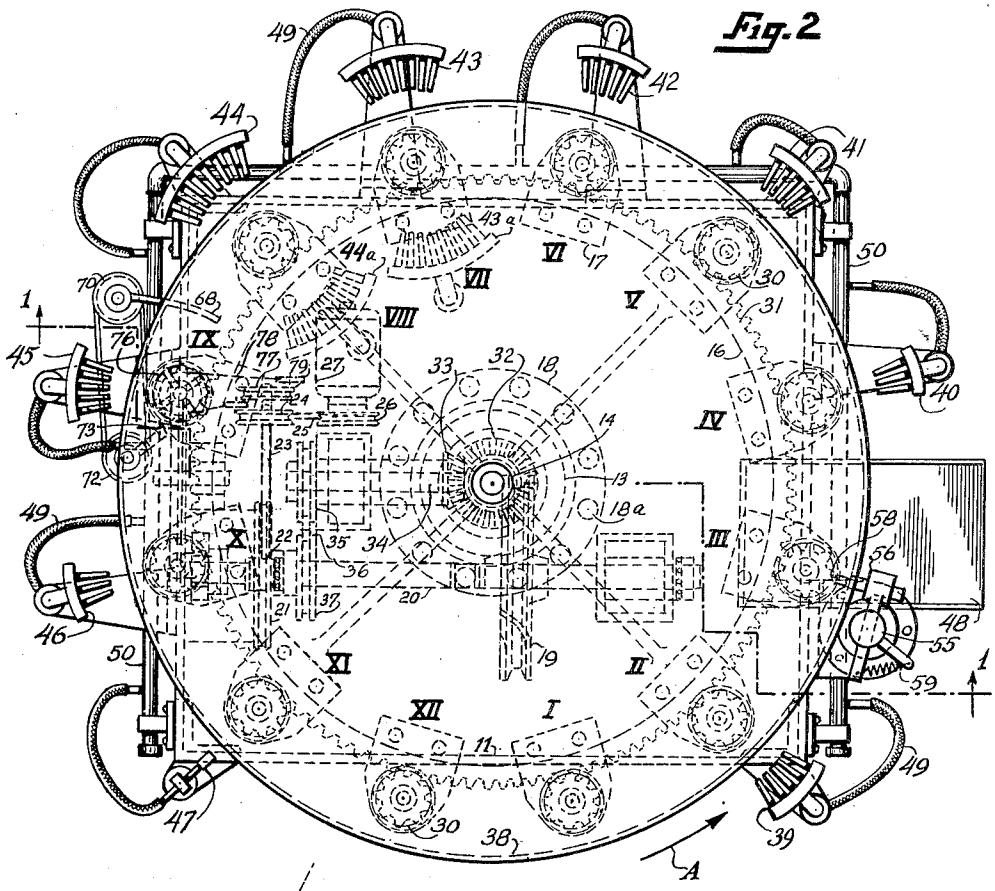
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Fig. 2



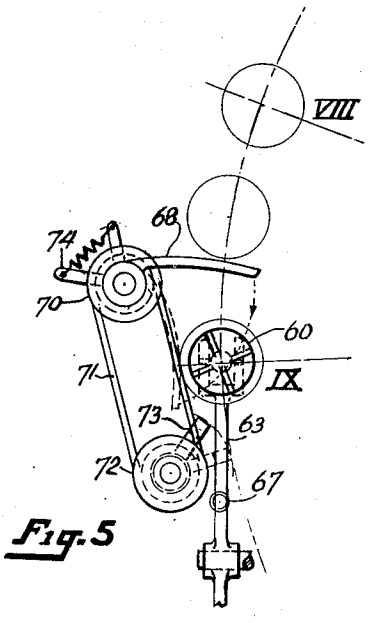


Fig. 5

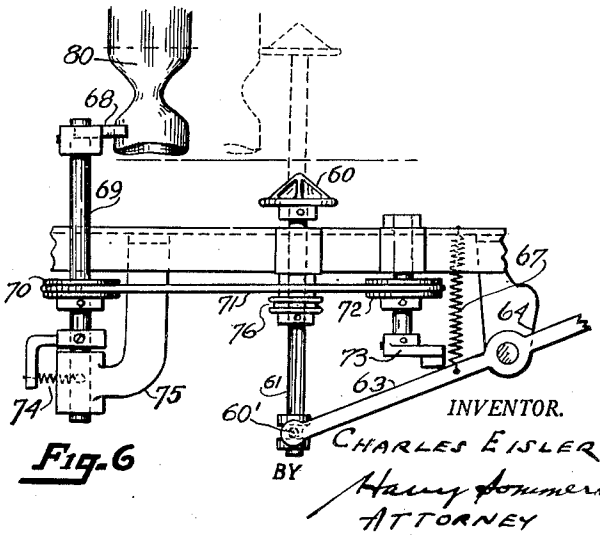


Fig. 6

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Patented Dec. 19, 1950

2,534,547

UNITED STATES PATENT OFFICE

2,534,547

MACHINE FOR CRACKING AND FLARING BLANKS

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Application January 31, 1950, Serial No. 141,400

5 Claims. (Cl. 49—1)

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The machine of the present invention is directed to the forming of inner and outer blanks for vacuum bottles. These blanks are formed pursuant to the invention in standard lengths and of certain structural features which will appear as the description progresses from blanks furnished by glass blowers. The blanks as supplied by the glass blowers have a round or dome-shaped top but their lower ends have a constriction corresponding to the original diameter of the tubing from which the blanks are blown. This constriction with the residual length below forms a cullet which has to be removed by a cracking off process followed by glazing or smoothing of the rim so defined. The rim of the inner blank will, in addition, have to be flared for the sealing process to be effected on a different machine.

The present invention is designed to provide a machine for effecting the automatic cracking off, glazing and flaring operations.

These and other advantageous objects, which will appear from the drawings, and from the description hereinafter, are accomplished by the structure of my invention, of which an embodiment is illustrated in the drawings. It will be apparent, from a consideration of said drawings, and the following description, that the invention may be embodied in other forms suggested thereby, and such other forms as come within the scope of the appended claims are to be considered within the scope and purview of the instant invention.

In the drawings:

Fig. 1 is a vertical, sectional, elevational view of a machine embodying the invention, taken on line 1—1 of Fig. 2,

Fig. 2 is a top plan view thereof,

Fig. 3 schematically illustrates the steps of cracking off and flaring pursuant to the invention, shown at positions A, B, C and D hereinafter more particularly described,

Fig. 4 is a perspective view of a scoring tool adapted to be used in carrying out the invention,

Fig. 5 is a schematic plan view showing a feeler device used in the machine to temporarily prevent the functioning of the flaring tool at station IX of the machine, and

Fig. 6 is a fragmentary elevational view, taken at station IX of the machine, showing the operative position of the flaring tool in dotted lines and the inoperative position thereof in full lines.

The drawings illustrate practical forms of the invention, showing the machine comprising a table 11 on which a vertical bearing 13 is

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mounted, said table being provided with legs 12. On the sleeve shaft 14 journalled in the bearing 13, there is keyed the spider 16 which carries the bearings 17 for the blank sockets. In the drawings, only twelve such bearings are shown. This number may be varied as desired. For use with blanks of relatively thick cross-section, for example, it may be found expedient to prolong the heating and glazing processes with the corresponding variation in the number of bearings.

The sleeve shaft 14, with spider 16, is indexed, for example, in the direction of arrow A (Fig. 2), by suitable means such as indexing plate 18 provided with rollers 18a engaging barrel cam 19 on main shaft 20. On shaft 20 is mounted wormwheel 21 meshing with worm 22 on shaft 23. On shaft 23 is mounted pulley 24 which, by belt 25, is driven by pulley 26 of motor 27.

The glass blanks are inserted in the clamping sockets 28 provided with shafts 29 on which are mounted pinions 30 meshing with headgear 31 which is mounted on the vertical shaft 15 rotatable in spider sleeve shaft 14. On shaft 15 is mounted bevel gear 32 meshing with bevel gear 33 on shaft 34 on which is also mounted pulley 37 rotated by belt 36 over pulley 35 on main shaft 20.

The above described transmission keeps the glass blanks revolving at all stations throughout the entire revolution of the spider—even at the loading (I) and unloading positions (II) of Fig. 2. The cover 38, secured to bearings 17, protects the mechanism on top of the spider from dust, etc.

Referring to Fig. 2, it is seen that the indexing stations are designated by the Roman numerals I to XII. At loading station I, the glass blank 85 with its cullet 80 is inserted by the operator into socket 28. It then moves to position II where it is pre-heated by burners 39. At position III of Fig. 1, position D of Fig. 3, the blank 85 is scored all around the requisite height above the cullet—the scoring combined with the lower temperature of the score-cutter causing the glass to crack off along the score line 81 to cut the blank to a standard length with a straight edge rim 82. The cullet 80 then drops into the discharge chute 48. The blank rim 82 is then subjected to a gradual glazing and smoothing process by means of progressively hotter burners 40, 41 and 42, at positions IV, V and VI respectively. It should be noted that the number of fires per burner are progressively increased, as a preliminary to the intense final heating by the cross-fires 43—43a and 44—44a at positions VII and

VIII respectively, in order to render the rim 82 of the blank sufficiently plastic for the flaring operation which takes place at position IX of Fig. 2—also indicated at D of Fig. 3.

The burners are fed oxygen and air for the cracking-off operation; at all other positions, a mixture of gas and air is used. The gas, air and oxygen are fed to the burners by means of ducts 49 from the supply pipes 50, with the usual mixers 51 (Fig. 1).

The scoring tool (Figs. 4 and 1) mounted on bracket 52 has the base 53 on which is swivelled (by pin 54) the tool holder 55 in which is slidably adjustable the arm 56 which carries the slidably adjustable cutter holder 57 provided with the scoring point 58, of any suitable abrasion-effecting material, such as Carborundum or diamond. The cutter holder is urged against the glass blank by the spring 59 between the tool holder and base. The adjustable arm and cutter holder permit the adjustment of the scoring tool to different diameter glass blanks.

At position IX (Figs. 2, 6, 1 and 3D), the glazed rim of the blank is flared by a flaring tool having the flaring head 60 having shaft 61 slidable in bearing 62 and connected as at 60' to lever 63 fulcrumed in hanger bearing 64 for reciprocation of shaft 61. Lever 63 carries roller 65 which is kept in following contact with cam 66 on shaft 20 by spring 67 (Fig. 1). When the glass blank has reached position IX, the flaring tool is raised into the blank and forms the flared rim 83 (Fig. 3D).

Occasionally the cracking-off of the cullet 80 at position III does not materialize as expected, in which case the blank with cullet still attached proceeds to the next positions. If the blank should reach the flaring position IX in that condition, the cullet 80 and lower part of the blank would collide with the flaring tool and be shattered. To prevent this, a feeler device has been provided which prevents the flaring tool from being raised when the cullet of the glass blank has not been cracked off. Referring to Figs. 5 and 6, it is seen that the feeler arm 68 mounted on vertical shaft 69 has been installed at a height which permits it to be contacted and turned, when engaged, by cullet 80 of the glass blank. Ordinarily, when the flare tool is in its lower position, the blank with its cullet would pass over it as indicated in full lines in Fig. 6, but when the flare tool is raised for the flaring operation as shown in dotted lines, the cullet 80 would collide with it. The feeler device, when engaged by a blank cullet, prevents this as follows: The feeler arm 68 is keyed to and turns shaft 69 which, through pulley 70, belt 71 and pulley 72 turns stop lever 73 over cam lever 63, which arrests its motion and prevents it from raising the flare tool shaft 61. After the blank and cullet have passed position IX, the arm 68 is released and returned to its original position responsive to spring 74 between shaft 69 and its bearing 75.

After flaring, the blank passes to positions X and XI for annealing by burners 46 and 47. At position XII, the finished blank is unloaded.

In Fig. 3, A shows the blank as the same is furnished by the glass blowers, with cullet 80 attached to be scored at the dotted line 81. B shows blank just after scoring by tool 58, with the cullet cracked off. C shows the subsequent glazing of the rim 82. D shows the blank just after being flared, the flaring tool emerging.

The flaring tool 60 is rotated at high speed by means of pulley 76 on shaft 61 by pulley 77 on shaft 23 and belt 78 over the small direction pulleys 79.

It will be appreciated that the outer blank for vacuum bottles is scored and the rim glazed. The rim of the inner blank is, in addition, flared. Actuation of the flaring device is prevented, as above noted, where the cullet remains fixed to the blank while approaching station IX of the machine.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A machine for cracking and flaring blanks having lower end cullets to form vacuum bottle blanks, having straight edge rims and flared rims, comprising clamping bearings in which the upper ends of the blanks may be positioned, means engaging said bearings to rotate the same on their axes and to advance the same from station to station in the machine, a scoring tool mounted at a station in the machine and spring means normally urging said tool into the path of the cullet end of the blank at said station to score the blank to break the cullet from the blank and form a straight edge, a flaring tool positioned at a subsequent station of the machine, means to move the flaring tool into the inner end of the blank when the blank reaches said station, to flare the rim, and a feeler device positioned in said machine in advance of the flaring tool and adapted, when engaged by a cullet portion of a blank, to hold the flare tool in inoperative position and prevent the same from moving into engagement with the blank.

2. In a machine as set forth in claim 1, said means to move the flaring tool including a lever engaging the tool to reciprocate the same into and out of engagement with the blank, the feeler device including means to engage the lever when the feeler device is engaged by the cullet portion of a blank, to prevent the lever from moving the flaring tool into engagement with the blank.

3. In a machine as set forth in claim 1, means for adjustably mounting the scoring tool to accommodate glass blanks of different diameters.

4. In a machine as set forth in claim 1, said scoring tool comprising a holder, a scoring point in said holder, and spring means engaging the holder urging the same into scoring position.

5. In a machine as set forth in claim 1, said means to move the flaring tool including a lever engaging the tool to reciprocate the same into and out of engagement with the blank, the feeler device including means to engage the lever when the feeler device is engaged by the cullet portion of a blank, to prevent the lever from moving the flaring tool into engagement with the blank, said scoring tool comprising a holder, a scoring point in said holder, and spring means engaging the holder urging the same into scoring position.

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No references cited.