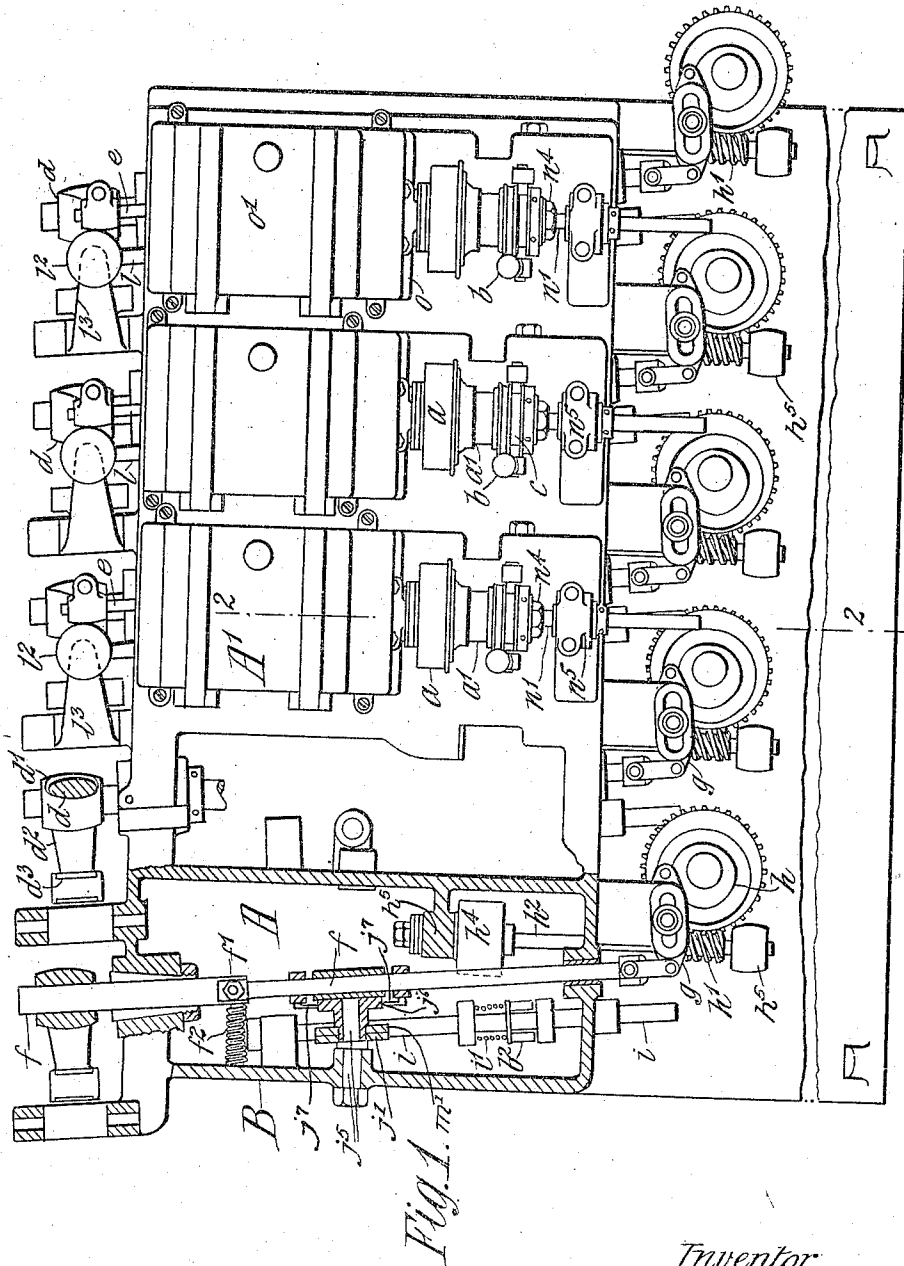


L. N. BRUNER,
GRINDING MACHINE.
APPLICATION FILED NOV. 8, 1916.

1,301,375.

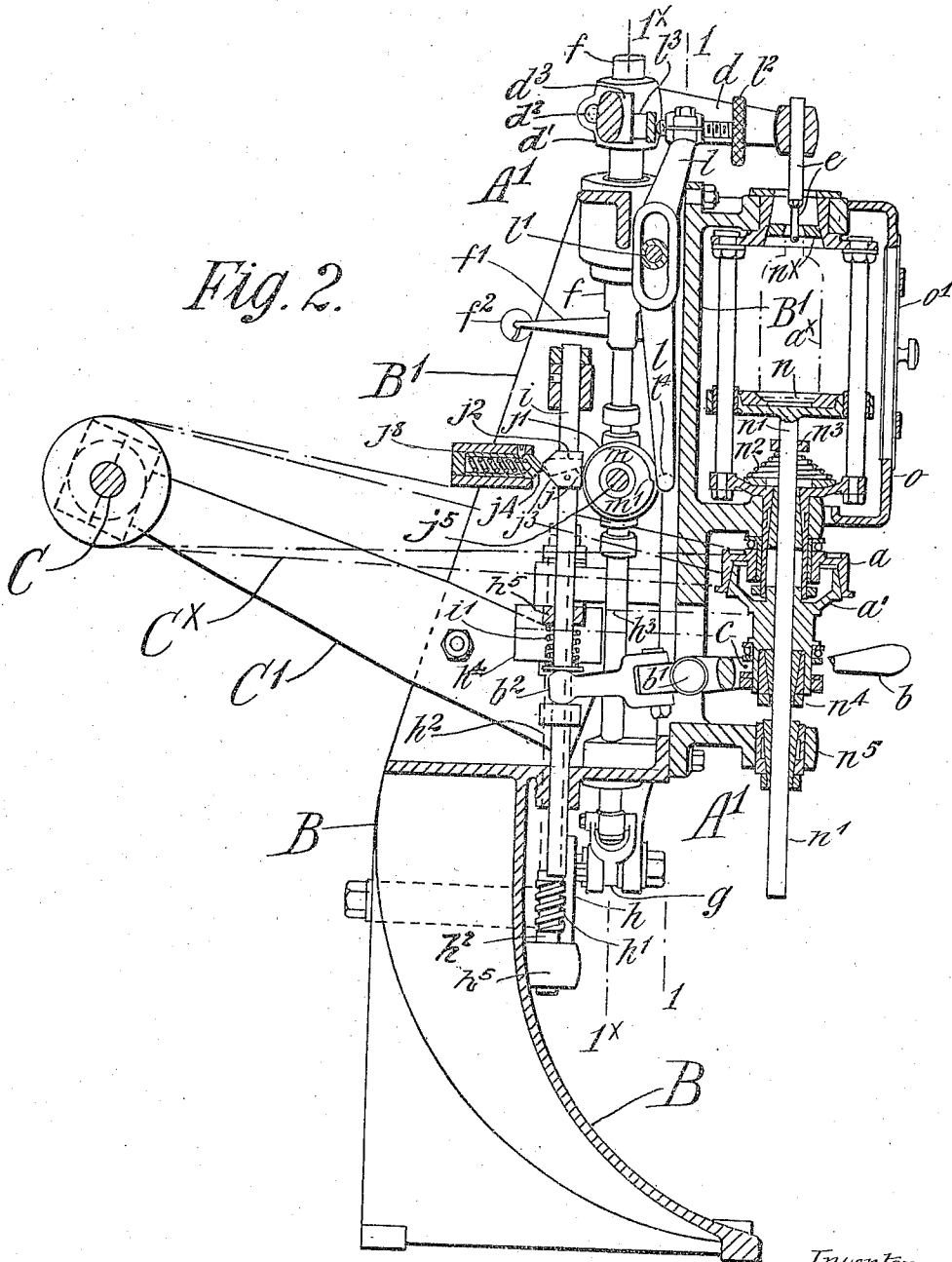
Patented Apr. 22, 1919.
2 SHEETS—SHEET 1.



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Fig. 2.



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UNITED STATES PATENT OFFICE.

LOUIS NAGLEE BRUNER, OF ZURICH, SWITZERLAND.

GRINDING-MACHINE.

1,301,375.

Specification of Letters Patent. Patented Apr. 22, 1919.

Application filed November 8, 1916. Serial No. 130,281.

To all whom it may concern:

Be it known that I, LOUIS NAGLEE BRUNER, a citizen of the United States of America, residing at 7 Bellerive Strasse, Zurich, Switzerland, glass manufacturer, have invented a certain new and useful Grinding-Machine, of which the following is a specification.

This invention has reference to glass-grinding or truing machines for grinding the mouths of glass bottles or jars and for like purposes, as described for instance in United States Specification No. 1011478.

According to the present invention the machine is so constructed that while the bottle is rapidly rotated, its mouth is acted on by a non-rotating truing or grinding tool, consisting of one or more diamonds in a suitable holder or pencil.

The bottle revolves in a suitable box or casing into which the grinding tool may be inserted, said tool being carried by a radial arm at the top of the machine and combined with devices which cause it to act automatically on the surface of the revolving bottle mouth with a longitudinal traversing or reciprocating motion. The said devices also automatically move it toward and from the work in a lateral or radial direction relatively to the center of the bottle mouth. The surface resulting from the action of the tool resembles in appearance an ordinary finely ground surface, and the wear on the diamond is infinitesimal.

The box or casing surrounding the revolving bottle and its supporting chucks, is provided with a circularly sliding or hinged door, through which the bottle is inserted and removed.

The motions are controlled automatically, for instance by cams or equivalent devices. The bottle is first placed in position and properly secured between the chuck device, the door of the box or casing is closed, and a clutch for transmitting motion at a high speed to the said chuck device is thrown into action. At the same time the mechanism causes the radial top arm to move the diamond tool or grinder radially or laterally slightly till it presses against the surface of the bottle mouth, and causes it to travel up and down or to and fro along the same a predetermined number of times, after which it is moved back radially clear of the said surface again, and the rotation is automati-

cally stopped to allow the bottle to be removed and a fresh one inserted.

The up and down strokes of the tool at the top of the machine, to produce the grinding action, are derived from a main or grinder-actuating cam at the bottom of the machine, which is driven by belting and gearing, from the aforesaid clutch.

The lateral motions of the said tool for applying it to and lifting it off the work are derived from an auxiliary or controlling cam.

This controlling cam is rotated by a movement derived from the main or grinder actuating cam, for instance through a ratchet and pawl arrangement operated by the up-and-down movement or strokes.

The automatic stoppage of the machine by disengaging the clutch is effected by any convenient mechanism at the same time that the control cam withdraws the tool laterally from the work.

There may be five or more sets or groups of the above elements or arrangements associated together to form a multiple machine.

In order that the invention may be clearly understood and readily carried into effect reference will now be had to the accompanying diagrammatic drawings which illustrate by way of example, one construction of machine in accordance therewith.

In these drawings:—

Figure 1 is a front view of machine having five groups of elements, the extreme left hand group and the portion next to it being in section on the lines 1* 1* and 1—1 of Fig. 2.

Fig. 2 is a transverse section on the line 2—2 of Fig. 1, at right angles to the section in that figure.

In the example shown, A and A¹ (Fig. 1) indicate two groups or sets of parts forming the sections or elements of the machine. B represents the main frame supporting these groups or sections of which there may be any desired number as above indicated. This frame is provided at the back with webs or partitions B¹ which lie between the different groups or sections.

C¹ is a bracket supporting the driving shaft C and pulley for a driving belt C^x, there being one such belt arrangement for each group or section of the machine.

According to this example, the parts of

each section, group or element, are driven from the belt C^x which serves to rotate a clutch a . The sliding part a^1 of this clutch can be actuated by a main lever b pivoted at b^1 through the pin-and-collar arrangement c , said main lever being adapted to be operated partly by hand, partly automatically.

a^x indicates the bottle which is to be acted upon.

10 The top arm d of each section or apparatus carries the inclined diamond-holder e and is moved up-and-down together with the inclined shaft f on which it is mounted, by means of a short lever g at the bottom, operated by a suitable cam h which constitutes the main or grinder actuating cam. This cam h is driven by a worm h^1 on a counter shaft h^2 , driven in its turn by the sliding part a^1 of the clutch a by an arrangement comprising a belt h^3 working over a counter pulley h^4 . h^5 are bearings supporting the worm shaft h^2 .

The action of the clutch a is controlled partly through a trip-device or thrust rod i which is connected with one end b^2 of the aforesaid main or controlling lever b , and partly also through a catch or projection j mounted on a pivot j^5 (Fig. 1) on a rotary disk j^1 . This disk is driven by a suitable ratchet wheel j^6 (Fig. 1) worked by spring pawls j^7 on or extending from the vertically reciprocating shaft or rod f which carries the top arm and the grinding tool. The catch j on the said disk engages a corresponding pivoted catch j^2 on the thrust rod at the moment the machine is required to stop automatically after the grinding is finished. In this way it forces a V-shaped piece or wedge j^3 on the thrust-rod past the edge of a similarly shaped spring-piece or plunger j^4 .

The part j^4 and its spring are situated within a tubular casing j^8 formed on or secured to the main frame. These two wedges j^3 j^4 thus form in effect a snap-over device, which gives the thrust or trip-rod i a sudden though slight movement. Through the end b^2 of the main or controlling lever b this slight movement will actuate the inside or sliding member a^1 of the clutch just enough to stop the machine. This brings the main cam h to rest and the up-and-down strokes of the diamond tool-holder e cease.

Normally this member a^1 is kept in engagement by the pressure of a spring i^1 which however is not sufficiently strong to put the clutch a in engagement against the resistance of the snap-over device, j^3 j^4 . Hence it will only act when the part j^3 and the thrust rod i are in one position (the downward position for instance) whereas its action ceases when the thrust rod is raised, and the clutch is disengaged.

Just previous to such disengagement however, the diamond carrier e is moved later-

ally inward (viz. away from the work and back toward the center of the bottle mouth) by a suitable spring f^2 connected at one end to the framing and at the other end to the outer extremity of the lever f^1 . The action of the diamond carrier e is controlled by a vertical or approximately vertical lever l pivoted adjustably at l^1 . This lever is worked by an auxiliary cam m and acts, through an adjusting screw l^2 and an intermediate piece l^3 , on the flat face d^3 of a sidewise projection or horizontal arm d^2 carried by the boss d^1 of the aforesaid top arm or lever d by which the grinding tool is supported.

Owing to the contact faces of the parts d^3 l^3 being made flat, as just mentioned, this arrangement permits the reciprocating rod and tool carrier to move up and down relatively to the intermediate piece without any interference from the latter.

The pressure of the above intermediate piece l^3 is controlled by auxiliary or control cam m moving with the aforesaid disk j^1 , and having a nose or projection m^1 . This cam moves the vertical lever l and thereby slightly rotates the top arm d sufficiently to press the diamond against the inside of the bottle mouth when required, and then when the projection m^1 on the cam clears the roller l^4 at the lower end of the lever l , it allows the diamond to move back (that is to say away from the glass) under the action of the aforesaid spring f^2 acting on an arm f^1 carried by the rod f .

When the bottle a^x is to be inserted into or removed from one of the sets of apparatus, the lower revolving chuck part n and its spindle n^1 are moved downward by depressing the handle of the main lever b counter to the pressure of a conical or other spring n^2 the extent of motion being limited for instance, by the distance between a collar n^4 on the spindle n^1 and the bottom bearing n^5 thereof.

This collar n^4 is fast on the spindle n^1 but has a certain amount of endwise play inside the boss of the sliding clutch-member a^1 which allows the bottom chuck n and its spindle n^1 to adjust themselves, for slight variations in the length of the bottles, under the action of the conical spring n^2 acting against a nut n^3 . For greater variations in length of the bottles, the lower nut or collar n^4 is slackened so as to loosen a conical grip or chuck nut with which it is combined. The spindle can then be re-adjusted accordingly in height as required after which the collar is again tightened up.

The conical or other spring n^2 above referred to, forces the parts upward with a pressure sufficient to hold the bottle mouth in the top chuck n^x but not sufficient to actually operate the V-pieces of the snap-over device j^3 j^4 and reengage the parts a a^1

of the clutch. In fact reengagement does not occur until the (now-raised) V-piece or wedge j^3 previously mentioned, is forced down past the point of the other V-piece or spring pusher j^4 by hand, by the main lever. The arrangement is analogous to that shown in Fig. 6 of the aforesaid specification No. 1011478 and no special claim is made to it.

10 When the lower end of the diamond presser-lever l slips over the nose m^1 of the cam m , so permitting the spring f^2 to slightly turn the shaft f and draw back the diamond away from the work, the projection or pin j on the disk j^1 engages under the pivoted catch j^2 and lifts it together with the block j^3 and shaft i upward again, so reversing the hand lever b . This movement is only sufficient however to move j^3 past j^4 and to disconnect the parts a a^1 of the clutch, and it is necessary for the operator to push the lever completely down to permit of the removal of the bottle.

To reengage the clutch-part a^1 therefore, it is necessary to give a sharp upward pull or movement to the handle of the main or controlling lever b , so forcing down the thrust rod i and again reversing the positions of the V-pieces of the snap-over device.

30 The stem e of the diamond carrier is tubular, or has a bore or axial passage through which water can flow to the diamond, and the main casing o of the section is closed during the grinding by a suitable door o^1 , as before indicated.

Obviously the invention may be modified in various ways in carrying the same into practice without departing from the general nature thereof.

40 I claim:—

1. In a machine for grinding bottle mouths, the combination of a diamond tool, a slightly rotating top arm carrying the same, a spring-controlled shaft slightly inclined from the vertical carrying said top arm and upright lever for turning said shaft and arm slightly in one direction counter to the spring, a cam for operating said lever, an adjusting screw at one end of said lever,

and a projection carried by said shaft and coöperating with the adjusting screw, substantially as described.

2. In a grinding machine, the combination of an upright chuck-device, a slightly inclined non-rotating diamond tool at the top of the machine projecting into the top of said chuck device, a clutch for driving said chuck, a main cam at the bottom of the machine driven from said clutch and imparting to-and-fro strokes to the tool and an auxiliary cam imparting lateral movements to the tool, substantially as described.

3. In a grinding machine of the kind referred to, the combination of an upright chuck device, a non-rotating diamond tool working at the top of said chuck device, a casing surrounding the latter, a movable door on said casing, a clutch for driving the chuck, cams for moving the tool to and fro and laterally, and means for stopping the machine automatically after the grinding, substantially as described.

4. In a bottle-grinding machine, the combination of a slightly inclined non-rotating diamond tool for grinding the interior of the bottle mouth, a chuck device for holding and rotating the bottle, a casing inclosing the chuck device, a clutch-driven spindle connected with the bottom member of the chuck, for imparting to and fro strokes to the diamond tool, a main cam driven from said clutch, an inclined shaft moved up and down by said grinder cam and having the diamond tool carried by an arm at its upper end, an auxiliary cam for imparting a slight twisting or rotary movement to the inclined shaft to control the contact between the diamond and the work, and means actuated step by step by the up-and-down movements of the inclined shaft for stopping the machine automatically when the grinding is finished, substantially as described.

In testimony whereof I have signed my name to this specification.

LOUIS NAGLEE BRUNER.

Witnesses:

CHARLES E. TAYLOR,
LUCY COSTIGAN.