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Patents Act 1990

NOTICE OF ENTITLEMENT

I, Gregory I. Wirzbicki
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of Unocal Science & Technology Division
376 South Valencia Avenue
Brea, California 92621 U.S.A.
being authorised by the Applicant(s)/Nominated Person(s) in respect of an application entitled:

TAKEOUT JAWS and under Application No. 63346/90

state the following:-

1. The Applicant(s)/Nominated Person(s) has/have, for the following reasons, gained entitlement from the actual inventor(s):-

   By virtue of an Assignment from the inventors.

2a.* The Applicant(s)/Nominated Person(s) is/are the applicant(s) of the of the basic application(s) listed* on the Patent Request/ *in the Declaration under Article 8 of the PCT.

2b.* The Applicant(s)/Nominated Person(s) is/are entitled to rely on the basic application(s) listed* on the Patent Request/ *in the Declaration under Article 8 of the PCT as follows:

   Application Serial No. 07/401,038 filed in the United States of America on 30 August 1989

3.* The basic application(s) listed *on the Patent Request/ *in the Declaration under Article 8 of the PCT is/are the application(s) first made in a Convention Country in respect of the invention.

~~4a.* The Applicant(s)/Nominated Person(s) is/are the depositor(s) of the deposit(s) listed in the Schedule hereto.~~

~~4b.* The Applicant(s)/Nominated Person(s) has/have the consent of ----------, of~~

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DATED this 11th day of March 19 92

UNION OIL COMPANY OF CALIFORNIA

By: (Signature)

Gregory F. Wirzbicki
Assistant Secretary
(Name & Title)

* Delete if not applicable.

IRN: INSTR CODE

23 JAN 1991

AU9063346

(12) PATENT ABRIDGMENT (11) Document No. AU-B-63346/90
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 647047

(54) Title
TAKEOUT JAWS

International Patent Classification(s)
(51)[5] **C03B 009/447**

(21) Application No. : **63346/90** (22) Application Date : **27.08.90**

(87) PCT Publication Number : **WO91/03431**

(30) Priority Data

(31) Number	(32) Date	(33) Country
401038	**31.08.89**	**US UNITED STATES OF AMERICA**

(43) Publication Date : **08.04.91**

(44) Publication Date of Accepted Application : **17.03.94**

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(56) Prior Art Documents
GB 2126211
US 3790205

(57) Claim

1. A takeout jaw assembly for handling hot glass articles, said assembly being comprised of:

(i) a holder comprising a wall and upper and lower shelf members, said wall and shelf members forming a substantially arcuate pocket; and

(ii) an insert matably fitting in the pocket of said holder, said insert having an inwardly projecting, substantially arcuate glass-contacting means extending beyond said shelf members for contact with hot glass articles;

the assembly being characterised by:

(iii) spring means supported from the wall of said holder and engaging said insert in a rear central portion thereof, for immovably but releasably retaining said insert in said pocket.

20. A takeout jaw holder comprising an arcuate wall from

.../2

which protrude upper and lower shelves forming a substantially arcuate pocket for matably receiving and holding an arcuate insert for contacting hot glass articles, said holder being characterised by a spring means for holding said insert in a rear central portion thereof immovably but releasably in said pocket.

22. A takeout jaw insert for contacting hot glass articles, said inset comprising a substantially arcuate body with at least one glass-contacting edge and being matable in a pocket of a takeout jaw holder, said insert being characterised by a depression in one of its surfaces in a substantially rear central location for mating with a spring means supported from the holder to immovably but releasably hold said insert within the pocket.

OPI DATE 08/04/91 APPLN. ID 63346 / 90

PCT AOJP DATE 16/05/91 PCT NUMBER PCT/US90/04852

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : C03B 9/44

A1

(11) International Publication Number: WO 91/03431

(43) International Publication Date: 21 March 1991 (21.03.91)

(21) International Application Number: PCT/US90/04852

(22) International Filing Date: 27 August 1990 (27.08.90)

(30) Priority data:
401,038 31 August 1989 (31.08.89) US

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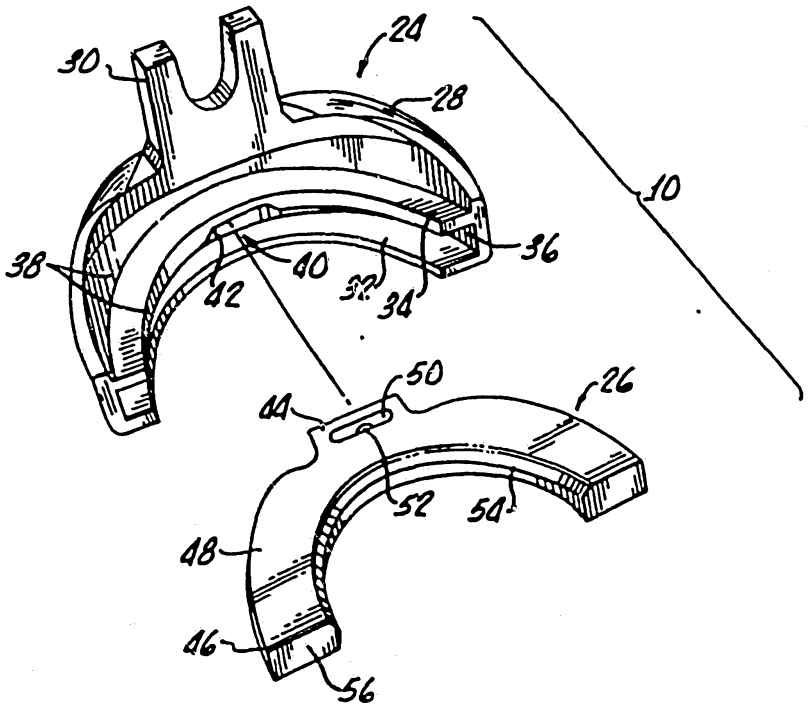
(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent)*, DK (European patent), ES (European patent), FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), SE (European patent).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: TAKEOUT JAWS



(57) Abstract

A takeout jaw (24) for use in a bottle-forming machine is formed in a semicircular shape and contains a spring clip for holding immovably a piece of non-metallic contact material within a pocket (36) in the body (28) of the takeout jaw.

* See back of page

TAKEOUT JAWS

Field of the Invention

This invention relates to the field of glass-making. In one of its more particular aspects, this invention relates to a fixture for use in a machine for lifting hot glass bottles from the molds in which they are formed. In another of its more particular aspects, this invention relates to the combination of such a fixture and a non-metallic contact material especially adapted for use in the fixture.

BACKGROUND OF THE INVENTION

Hot glass, especially when formed into various shapes in the manufacture of glass containers such as bottles, is susceptible to being damaged by contact with glass processing equipment. Most of the equipment with which hot glass comes in contact in the hot end process area during the manufacture of glass bottles is fabricated from metallic materials such as stainless steel and other alloys. However, in certain areas of the hot end processing of glass bottles, it has been found desirable to utilize non-metallic materials such as graphite, asbestos, plastics or carbon fibers.

One such application is in fixtures used to lift hot newly formed bottles from the mold in which they are formed and set them down on an air pad for cooling before being conveyed to the annealing furnace. These fixtures are called takeout jaws or tongs. Since metallic takeout jaws may cause scratching or checking by contact with the hot formed bottles, takeout jaws are frequently fabricated with a non-metallic insert for contacting the hot glass. Checking, which is the formation of imperceptible cracks due to sudden localized heat transfer or thermal shock, can be, thereby, largely prevented and scratching is minimized. This is particularly important in the current production of lighter weight, more fragile bottles which require gentler handling.

Of the materials which have been used as inserts for takeout jaws, the most satisfactory to date has proven to be graphite. Although other non-metallic materials have been used, most such non-metallic materials are not completely suitable for use in lifting the hot containers from the molds. Asbestos, which was used at one time, has proved to be undesirable for safety and environmental reasons. Plastics suitable for use at the high temperatures encountered in the hot end process area must be specially formulated and yet have a relatively short service life. Graphite has been found to possess properties which are particularly adapted for contacting hot glass containers including high strength, resistance to oxidation, non abrasive surface integrity, heat resistance, low porosity and

long service life.

One of the disadvantages of the takeout jaws previously available was the frequent need to replace worn parts during the course of use in the bottle-forming machine. This wear was caused largely by the movement of takeout jaw inserts within the jaw. Inserts were commonly held in position by steel detent balls positioned in holes in the takeout jaws. Detent balls were subject to wear and fouling due to the accumulation of grease, oil and foreign matter. The detent balls could hang up in their holes permitting the insert to fall out, causing loss of the insert and loss of production. Detent balls seldom provided tight enough fits of the insert to render the insert immovable within the jaw. Some degree of play between the insert and jaw was therefore almost always present.

Coupled with the fact that jaws having close tolerances could not be readily fabricated from cast bronze, the form of takeout jaws conventionally manufactured, the play between the jaw and insert resulted in wear of the insert, necessitating frequent replacement thereof. In most instances, because of the lack of close tolerances in the takeout jaws, replacement of both inserts from a pair of takeout jaws was necessary.

It would, therefore, be desirable to provide takeout jaws which reduce the wear on inserts and in which the inserts can be readily replaced in the event of wear or damage without having to replace parts of the jaws themselves.

SUMMARY OF THE INVENTION

The present invention provides takeout jaws which are designed to hold a piece of non-metallic contact material under spring tension in a manner such that the contact material does not move within the takeout jaws upon contacting a hot glass container. Because the contact material is held securely in position by spring tension, it is possible to lift the hot containers in a manner such that damage to the containers is minimized. Whereas takeout jaws which were previously used permitted a certain amount of movement of the inserts within the takeout jaws, the takeout jaws of the present invention do not permit such movement. Thus, the takeout jaws can be machined to close tolerances enabling the container lifting machine to operate as a precision machine. Because of the resulting gentle handling of the hot containers, it has become feasible to produce lighter weight glass containers and to increase the efficiency and hence the output.

A takeout jaw of the present invention comprises a generally arcuate holder for an arcuate piece of non-metallic contact material, means at the middle of the arc formed by said arcuate holder for holding said arcuate piece immovably within said arcuate holder, and means integral with said holder for attaching the jaw to a support therefor.

The takeout jaws of the present invention permit higher bottle yields and decrease the need for replacement of the contact material inserts.

In accordance with one aspect of the invention there is provided a takeout jaw assembly for handling hot glass articles, said assembly being comprised of:

(i) a holder comprising a wall and upper and lower shelf members, said wall and shelf members forming a substantially arcuate pocket; and

(ii) an insert matably fitting in the pocket of said holder, said insert having an inwardly projecting, substantially arcuate glass-contacting means extending beyond said shelf members for contact with hot glass articles;

the assembly being characterised by:

(iii) spring means supported from the wall of said holder and engaging said insert in a rear central portion thereof, for immovably but releasably retaining said insert in said pocket.

Preferably said takeout jaw assembly is characterised by said spring means comprising a spring which is affixed to the holder and engages into a depression in a surface of the insert.

Preferably said takeout jaw assembly is characterised in that the holder includes a yoke extending upwardly from said wall for engagement with a lifting means.

Preferably said takeout jaw assembly is characterised in that the insert is a substantially monolithic arcuate

member.

Preferably said takeout jaw assembly is characterised in that the pocket is substantially semicircular and the insert is a substantially semicircular monolithic member, the insert having substantially semicircular front and rear surfaces in annular relationship.

Preferably said takeout jaw assembly is characterised by said insert having depression formed in a surface adjacent its rear edge for receiving said spring.

Preferably said takeout jaw assembly is further characterised by:

(i) said top and bottom shelf members of said holder being substantially parallel;

(ii) said insert located in said pocket having depression adjacent a rear edge thereof; and

(iii) said spring means comprising a flat spring attached to an outer surface of the wall, the flat spring extending through an opening in the wall and engaging the depression in said insert.

Preferably said takeout jaw assembly is characterised by:

(i) the holder comprising:

a semicircular wall having front and rear surfaces;

upper and lower semicircular shelves perpendicular to said wall and projecting in parallel from said front surface, the shelves forming a semicircular pocket with said wall at the bottom of said holder; and

a yoke extending upwardly from said wall;

(ii) the insert being a substantially semicircular, annular member further comprising a lug formed at a rear edge of said insert and extending matably into an opening in said wall, with said lug having a depression extending substantially parallel to the diameter of said semicircular insert; and

(iii) said spring means comprising a spring clip attached to the outside of the wall of said holder and extending through an opening in said wall formed by cutouts in said wall and said upper shelf, said spring clip and said depression being in mating relation to immovably retain said insert within said pocket.

Preferably said takeout jaw assembly is characterised by said insert having depression in a lug substantially centrally located in the rear portion of said insert.

Preferably said takeout jaw assembly is characterised in that said holder is metallic.

Preferably said takeout jaw assembly is characterised in that said holder is fabricated of machine steel.

Preferably said takeout jaw assembly is characterised by containing only one spring.

Preferably said takeout jaw assembly is characterised by the insert being held immovably in place by a spring means comprising only one flat spring clip affixed at one end to the rear surface of said wall, said spring clip extending in a substantially horizontal direction along a portion of the upper surface of said insert, said spring clip engaging a depression in the rear portion of said insert.

Preferably said takeout jaw assembly is characterised by the one spring being centrally located in said pocket, substantially symmetrically bisecting the holder and the insert about a vertical plane.

Preferably said takeout jaw assembly is characterised by the depression comprising a longitudinal slot in the upper surface of a lug in the rear portion of said insert, said slot running perpendicular to said vertical plane.

Preferably said takeout jaw assembly is characterised in that said contacting means comprises at least one radially inwardly projecting, substantially arcuate edge extending beyond the shelf members for contacting the hot glass articles.

Preferably said takeout jaw assembly is characterised in that said radially inwardly projecting edge is substantially semicircular.

Preferably said takeout jaw assembly is characterised in that the insert is nonmetallic.

Preferably said takeout jaw assembly is characterised in that the insert is composed of graphite.

In accordance with a second aspect of the present invention there is provided a takeout jaw holder comprising an arcuate wall from which protrude upper and lower shelves forming a substantially arcuate pocket for matably receiving and holding an arcuate insert for contacting hot glass articles, said holder being characterised by a spring means for holding said insert in a rear central portion thereof immovably but releasably in said pocket.

In accordance with a third aspect of the present invention there is provided a takeout jaw insert for contacting hot glass articles, said inset comprising a substantially arcuate body with at least one glass-contacting edge and being matable in a pocket of a takeout jaw holder, said insert being characterised by a depression in one of its surfaces in a substantially rear central location for mating with a spring means supported from the holder to immovably but releasably hold said insert within the pocket.

Preferably said takeout jaw insert is characterised by:

a substantially monolithic arcuate body with arcuate front and rear surfaces in substantially annular relationship, with said front surface having a radially inwardly projecting, substantially arcuate edge for contact with hot glass articles;

a lug having a depression therein, said lug extending outwardly from the central portion of said rear surface; and

the insert being receivable within the pocket of the holder and being held immovably therein by a mating relationship between the spring means and the depression.

Preferably said takeout jaw insert is characterised by:

(1) the insert being in the form of a substantially semicircular, annular, monolithic body terminating in two substantially planar edges which lie at opposing ends of the diameter of said semicircular, annular, monolithic body; and

(2) the depression extending as a longitudinal slot in the

lug in a direction parallel to said diameter.

Preferably said takeout jaw insert is characterised by an upper planar surface and a lower planar surface, said surfaces lying in substantially parallel planes, said upper planar surface having the depression therein.

Preferably said takeout jaw insert is characterised in that the body is a substantially semicircular monolithic body defined by a substantially planar upper surface, a substantially planar bottom surface parallel with the upper surface, two planar end surfaces defining each end of the semicircular body, a curved front surface, and a curved rear surface in substantially annular relationship with the front surface, said front and rear surfaces extending between the two planar end surfaces, the front surface having an inwardly projecting glass contacting edge precision matable with a hot glass article.

Preferably said takeout jaw insert is characterised by a substantially semicircular body in the form of an annular fragment, having substantially semicircularly curved front and rear surfaces, with the front surface having an inwardly projecting edge for contacting hot glass articles.

Preferably said takeout jaw insert is characterised by an inwardly projecting edge on the front surface comprising helical reliefs for contacting threaded hot bottles.

Preferably said takeout jaw insert is characterised by being symmetrically bisectable by a vertical plane.

Preferably said takeout jaw insert is composed of graphite.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be more readily understood by reference to the accompanying drawings wherein like numerals refer to like elements and in which:

Figure 1 is a pictorial view of the takeout area of a bottle-making machine showing takeout jaws in position over recently formed glass bottles;

Figure 2 is a perspective view of a takeout jaw and insert of the present invention showing the insert removed from the jaw;

Figure 3 is a vertical front elevation of a takeout jaw of the present invention with the insert removed;

Figure 4 is a vertical side elevation partly in cross-section of a takeout jaw and insert of the present invention showing the insert removed from the jaw; and

Figure 5 is a plan view of an insert of the present invention.

Figure 6 is a greatly enlarged cross-section of a portion of a takeout jaw of the present invention show the spring in its untensioned condition.

Figure 7 is an enlarged cross-section of a portion of a takeout jaw and partially mated insert showing the spring in its fully tensioned condition.

Figure 8 is an enlarged cross-section of a portion of a takeout jaw and fully mated insert showing the spring in its untensioned condition.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The takeout jaws of the present invention permit higher bottle yields, are economically producible in small quantities and are characterized by decreased need for replacement of inserts.

The design of the takeout jaw of the present invention permits machining to close tolerances, thereby ensuring accurate and precise set up on the bottle forming machine. The precision machining of the takeout jaws combined with the tightness of the insert in the pocket of the jaw which contains the insert enables the takeout jaws to be accurately located in the bottle, in a reproducible manner, thereby reducing deformation of the bottle finish, that is, the top of the bottle, due to misalignment and consequently the number

of bottles which must be scrapped. If desired, where threaded finishes are produced, the inserts can be designed to contact the threaded finish only at the root and on the underside of the threads to further decrease the likelihood of damage.

The machine fabrication of the takeout jaws of the present invention eliminates the high cost of tooling of the cast takeout jaws of the prior art and enables economic production even in relatively small quantities. Whereas the cast bronze takeout jaws of the prior art had to be manufactured in quantities of thousands of units to justify the high initial cost of tooling, the machined takeout jaws of the present invention can be manufactured economically in quantities as low as hundreds of units. Furthermore, the arcuate or semicircular shape of the takeout jaws of the present invention lends itself to being turned on a lathe. In addition, the number of parts required for the spring clip which retains the insert within a semicircular pocket in the takeout jaw is three, including spring, bolt and washer, for each takeout jaw compared to eight for the detent ball retainer, which requires two detent ball assemblies per jaw, each consisting of ball, leaf spring retainer, screw and washer.

One of the major modes of insert failure is chipping of the surface of the insert. More precise mating of the insert with the bottle finish ensured by the close tolerance machining which is possible with the semicircular design of the insert of the present

invention reduces the risk of chipping. The semicircular design of the pocket in which the insert is retained and the semicircular configuration of the insert ensure that the maximum surface contact between jaw and insert is realized. Since the insert contacts a large surface area of the pocket in the jaw and since the insert is held immovably within the pocket by a single insert retaining spring which is positioned at the center of the semicircular pocket, there can be no play between the insert and takeout jaw. Thus abrasion of the bottom surface of the insert caused by such play is eliminated. Precise alignment of the takeout jaws and bottles is thus maintained, reducing damage to bottles and increasing the life of the insert.

Referring to the drawings, Fig. 1 depicts the environment in which the takeout jaws of the present invention are used. The number 10 represents a series of the takeout jaws of the present invention, which are positioned above a series of hot bottles 12. Takeout jaws 10 are connected to a lifting arm 14. Bottles 12 have just been removed from a bottle forming mold 16 and are suspended just above air pad 18 by a cushion of air, the source of which is not shown. Hot bottles 12, which were red hot when lifted out of the mold by takeout jaws 10, are cooled upon air pad 18 and then transferred to a conveyor belt 20 for transport to an annealing furnace, not shown. Cooled bottles 22 are shown upon conveyor belt 20.

Referring to Fig. 2, a single takeout jaw 24 is shown along with a mating insert 26. Takeout jaw 24

has a semicircular body 28 and a yoke 30 for attachment to a lifting arm. Body 28 has a base 32 and a shelf 34 which form between them a semicircular pocket 36. Pocket 36 is open at the front and closed at the rear by semicircular back wall 38 of body 28 except for an opening 40 in the center of back wall 38. A center portion 42 is the lower surface of shelf 34 is cut out to provide clearance for a spring clip, not shown. Insert 26 is generally semicircular in form except for a lug 44 formed by cutting notches in the back wall 46 of insert 26. The upper surface 48 of insert 26 has a depression 50 with a hole 52 in the bottom thereof. Hole 52 is used for locating or fixturing purposes in machining insert 26 to the desired dimensions.

The front surface 54 is generally semicircular except for two flat portions 56 at either end of the semicircle. If desired, front surface 54 can be threaded to provide a convenient means for contacting bottles having threaded finishes.

Fig. 3, in addition to the features described with respect to Fig. 2, has a spring clip 58 shown in opening 40 at center portion 42.

Fig. 4 shows the several horizontal surfaces in phantom and also shows that the insert is adapted to be positioned within the pocket in the takeout jaw and that the spring clip and depression in the insert are lined up to be engaged. Spring clip 58 is attached to back wall 38 of takeout jaw 24 by means of a screw 60 and a washer 62.

Figs. 5, 6, 7 and 8 illustrate how the insert fits within the takeout jaw. As can be seen from these figures, the spring clip is normally untensioned as shown particularly in Fig. 6. As the insert is pushed in the direction shown by arrow 64, the lug 44 engages spring clip 58 and causes it to become tensioned. Then, when the insert is pushed all the way in, spring clip 58 is snapped into depression 50 and becomes untensioned as in Fig. 6. Removal of insert 26 from takeout jaw 24 will then require exertion of a large force to tension spring clip 58 allowing removal of insert 26 from takeout jaw 24.

As pointed out above, graphite is the material of choice for fabricating the takeout jaw inserts of the present invention. Various grades of graphite are commercially available. A particularly desirable material is a fine particle, high strength, isotropic graphite available from POCO Graphite, Inc., a subsidiary of UNOCAL Corporation, Decatur, Texas, which is sold as GLASSMATE^{R} graphite contact material.

While particular embodiments of the invention have been described, it will be understood, of course, that the invention is not limited thereto, since many obvious modifications can be made. It is intended to include any such modifications as will fall within the scope of the appended claims.

THE CLAIMS defining the invention are as follows:-

1. A takeout jaw assembly for handling hot glass articles, said assembly being comprised of:

(i) a holder comprising a wall and upper and lower shelf members, said wall and shelf members forming a substantially arcuate pocket; and

(ii) an insert matably fitting in the pocket of said holder, said insert having an inwardly projecting, substantially arcuate glass-contacting means extending beyond said shelf members for contact with hot glass articles;

the assembly being characterised by:

(iii) spring means supported from the wall of said holder and engaging said insert in a rear central portion thereof, for immovably but releasably retaining said insert in said pocket.

2. The takeout jaw assembly of claim 1 characterised by said spring means comprising a spring which is affixed to the holder and engages into a depression in a surface of the insert.

3. The takeout jaw assembly as claimed in claim 1 or 2 characterised in that the holder includes a yoke extending upwardly from said wall for engagement with a lifting means.

4. The takeout jaw assembly as claimed in any one of the preceding claims characterised in that the insert is a substantially monolithic arcuate member.

5. The takeout jaw assembly as claimed in any one of claims 1 to 3 characterised in that the pocket is substantially semicircular and the insert is a substantially semicircular monolithic member, the insert having substantially semicircular front and rear surfaces in annular relationship.

6. The takeout jaw assembly as claimed in any one of the preceding claims characterised by said insert having depression formed in a surface adjacent its rear edge for receiving said spring.

7. The takeout jaw assembly as claimed in any one of claims 1, 3, 4 or 5 further characterised by:

(i) said top and bottom shelf members of said holder being substantially parallel;

(ii) said insert located in said pocket having depression adjacent a rear edge thereof; and

(iii) said spring means comprising a flat spring attached to an outer surface of the wall, the flat spring extending through an opening in the wall and engaging the depression in said insert.

8. The takeout jaw assembly as defined in claim 1 characterised by:

(i) the holder comprising:

a semicircular wall having front and rear surfaces;

upper and lower semicircular shelves perpendicular to said wall and projecting in parallel from said front surface, the shelves forming a semicircular pocket with said wall at

the bottom of said holder; and

a yoke extending upwardly from said wall;

(ii) the insert being a substantially semicircular, annular member further comprising a lug formed at a rear edge of said insert and extending matably into an opening in said wall, with said lug having a depression extending substantially parallel to the diameter of said semicircular insert; and

(iii) said spring means comprising a spring clip attached to the outside of the wall of said holder and extending through an opening in said wall formed by cutouts in said wall and said upper shelf, said spring clip and said depression being in mating relation to immovably retain said insert within said pocket.

9. The takeout jaw assembly as claimed in any one of claims 2 to 5, 7 and 8 characterised by said insert having depression in a lug substantially centrally located in the rear portion of said insert.

10. The takeout jaw assembly as claimed in any one of the preceding claims characterised in that said holder is metallic.

11. The takeout jaw assembly as claimed in any one of claims 1 to 9 characterised in that said holder is fabricated of machine steel.

12. The takeout jaw assembly as claimed in any one of the preceding claims characterised by containing only one spring.

13. The takeout jaw assembly of claim 12 characterised by

the insert being held immovably in place by a spring means comprising only one flat spring clip affixed at one end to the rear surface of said wall, said spring clip extending in a substantially horizontal direction along a portion of the upper surface of said insert, said spring clip engaging a depression in the rear portion of said insert.

14. The takeout jaw assembly of claim 12 or 13 characterised by the one spring being centrally located in said pocket, substantially symmetrically bisecting the holder and the insert about a vertical plane.

15. The takeout jaw assembly of claim 14 characterised by the depression comprising a longitudinal slot in the upper surface of a lug in the rear portion of said insert, said slot running perpendicular to said vertical plane.

16. The takeout jaw assembly as claimed in any one of the preceding claims characterised in that said contacting means comprises at least one radially inwardly projecting, substantially arcuate edge extending beyond the shelf members for contacting the hot glass articles.

17. The takeout jaw assembly of claim 16 characterised in that said radially inwardly projecting edge is substantially semicircular.

18. The takeout jaw assembly as claimed in any one of the preceding claims characterised in that the insert is nonmetallic.

19. The takeout jaw assembly as claimed in any one of claims 1 to 17 characterised in that the insert is composed of graphite.

20. A takeout jaw holder comprising an arcuate wall from

which protrude upper and lower shelves forming a substantially arcuate pocket for matably receiving and holding an arcuate insert for contacting hot glass articles, said holder being characterised by a spring means for holding said insert in a rear central portion thereof immovably but releasably in said pocket.

21. The takeout jaw holder as claimed in claim 20 for making the takeout jaw assembly of any one of claims 1 to 19.

22. A takeout jaw insert for contacting hot glass articles, said inset comprising a substantially arcuate body with at least one glass-contacting edge and being matable in a pocket of a takeout jaw holder, said insert being characterised by a depression in one of its surfaces in a substantially rear central location for mating with a spring means supported from the holder to immovably but releasably hold said insert within the pocket.

23. The takeout jaw insert of claim 22 held within the pocket of said holder to form the takeout jaw assembly of any of one claims 1 to 19.

24. The takeout jaw insert of claim 22 or 23 characterised by:

a substantially monolithic arcuate body with arcuate front and rear surfaces in substantially annular relationship, with said front surface having a radially inwardly projecting, substantially arcuate edge for contact with hot glass articles;

a lug having a depression therein, said lug extending outwardly from the central portion of said rear surface; and

the insert being receivable within the pocket of the holder and being held immovably therein by a mating relationship between the spring means and the depression.

25. The takeout jaw insert of claim 24 characterised by:

(1) the insert being in the form of a substantially semicircular, annular, monolithic body terminating in two substantially planar edges which lie at opposing ends of the diameter of said semicircular, annular, monolithic body; and

(2) the depression extending as a longitudinal slot in the lug in a direction parallel to said diameter.

26. The takeout jaw insert of any of claims 22 to 25 characterised by an upper planar surface and a lower planar surface, said surfaces lying in substantially parallel planes, said upper planar surface having the depression therein.

27. The takeout jaw insert as claimed in any one of claims 22, 23 or 24 characterised in that the body is a substantially semicircular monolithic body defined by a substantially planar upper surface, a substantially planar bottom surface parallel with the upper surface, two planar end surfaces defining each end of the semicircular body, a curved front surface, and a curved rear surface in substantially annular relationship with the front surface, said front and rear surfaces extending between the two planar end surfaces, the front surface having an inwardly projecting glass contacting edge precision matable with a hot glass article.

28. The takeout jaw insert as claimed in any one of claims 22, 23 or 24 characterised by a substantially semicircular

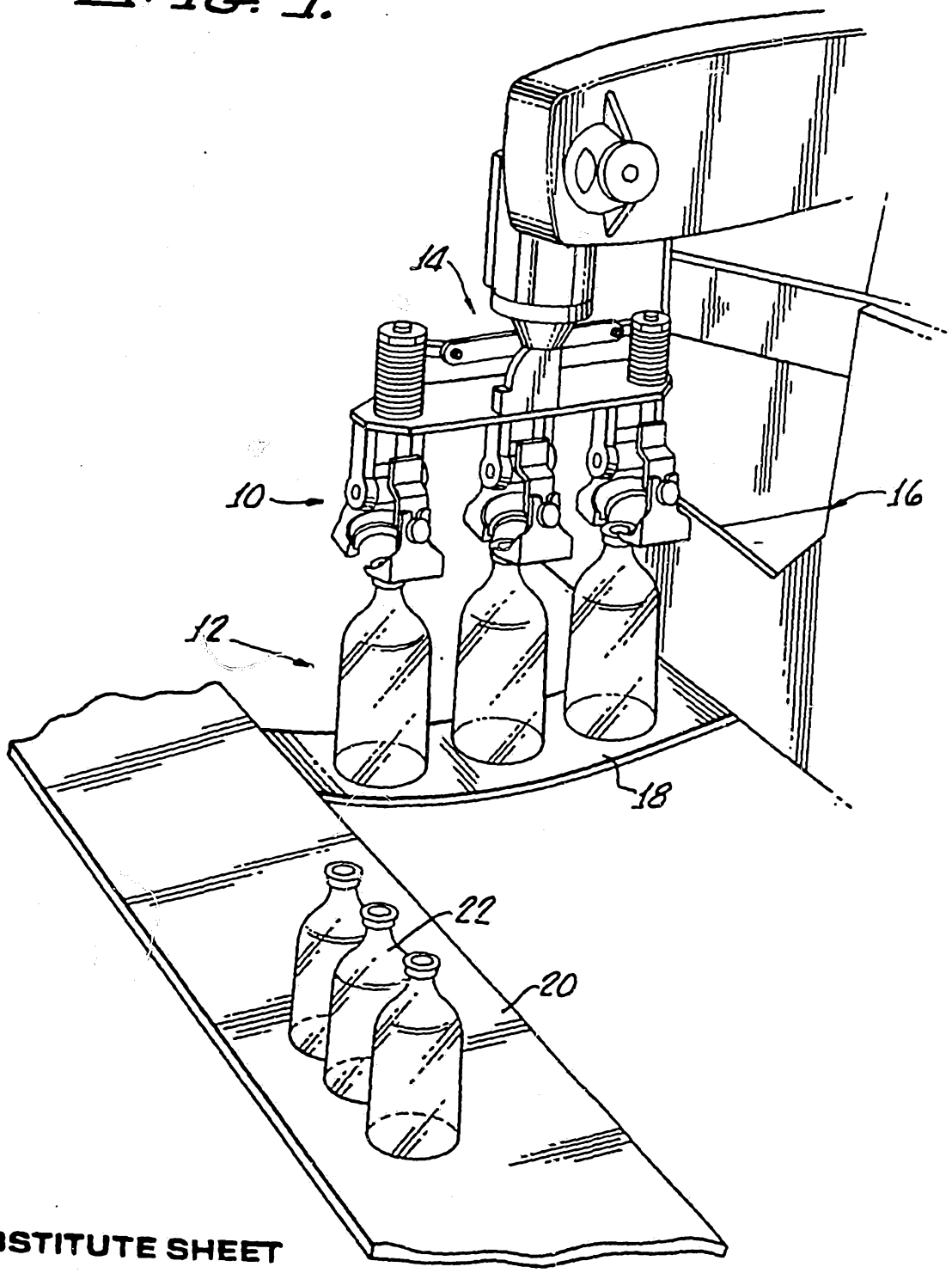
body in the form of an annular fragment, having substantially semicircularly curved front and rear surfaces, with the front surface having an inwardly projecting edge for contacting hot glass articles.

29. The takeout jaw insert as claimed in any one of claims 22 to 28 characterised by an inwardly projecting edge on the front surface comprising helical reliefs for contacting threaded hot bottles.

30. The takeout jaw insert as claimed in any one of claims 24 to 29 characterised by being symmetrically bisectable by a vertical plane.

31. The takeout jaw insert as claimed in any one of claims 22 to 30 composed of graphite.

FIG. 1.



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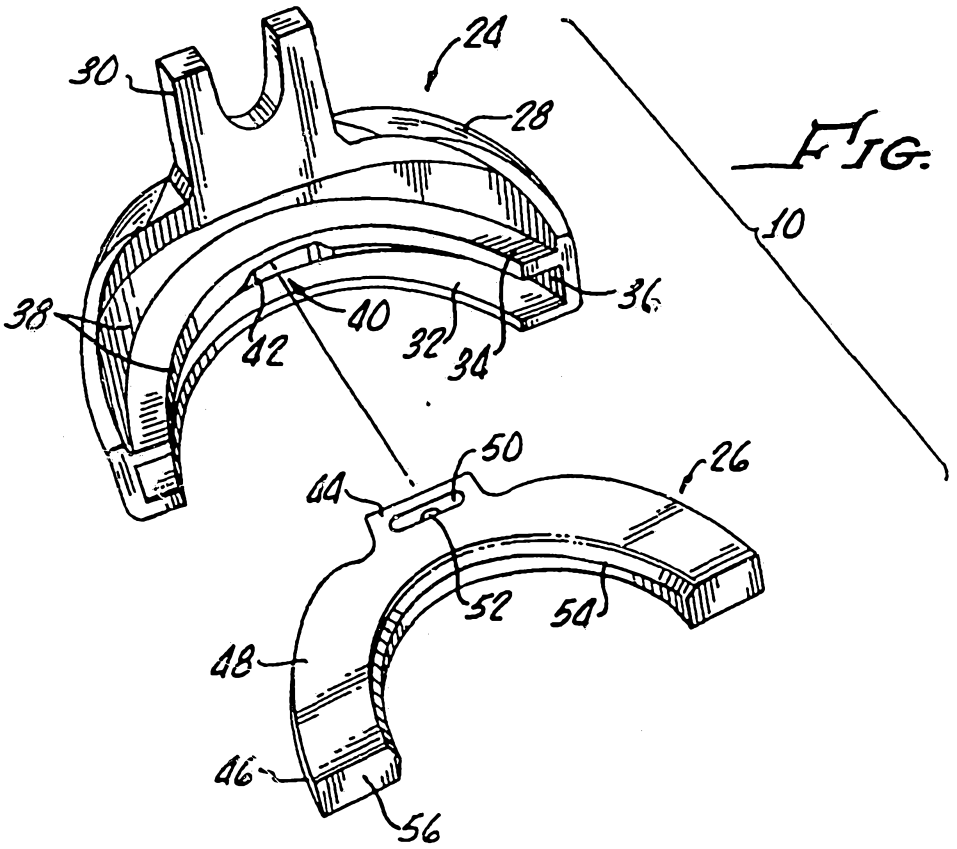


FIG. 2.

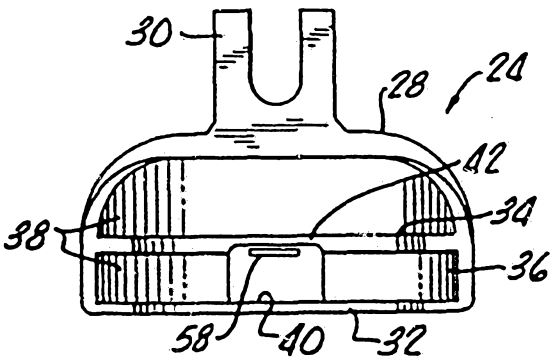


FIG. 3.

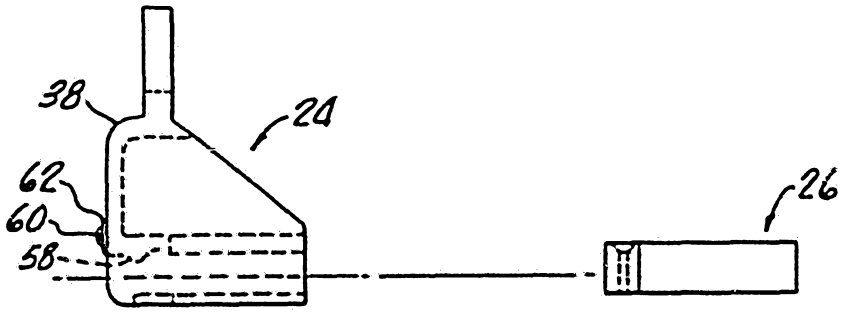


FIG. 4.

FIG. 5.

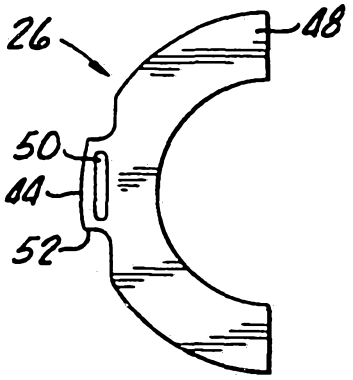


FIG. 6.

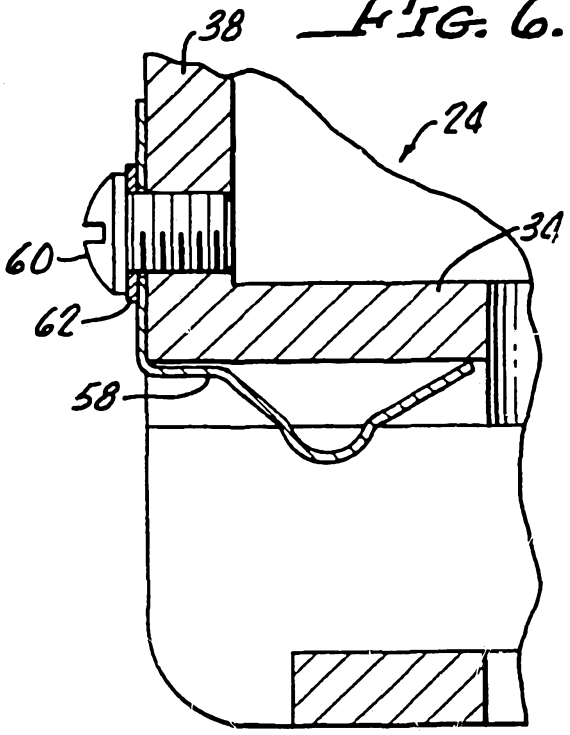
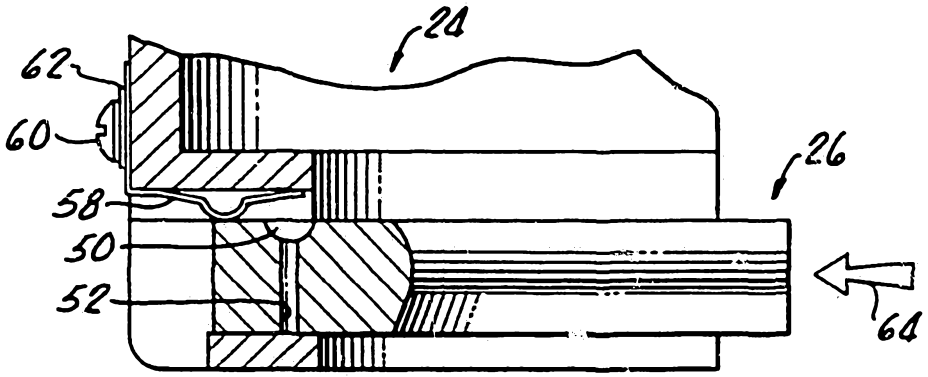


FIG. 7.



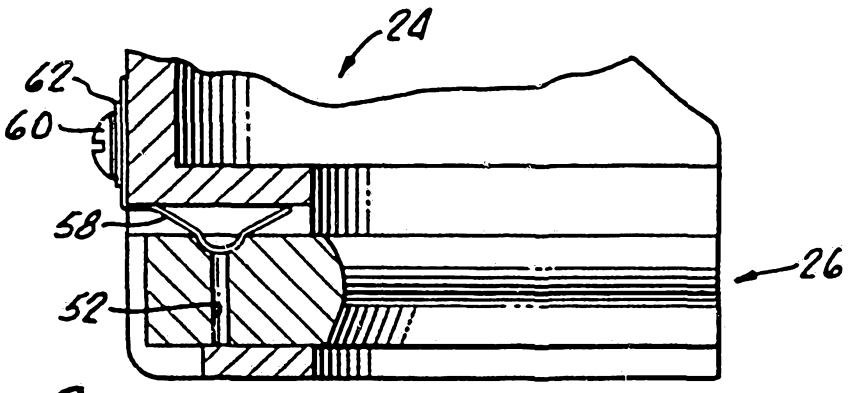


FIG. 8.

INTERNATIONAL SEARCH REPORT

International Application No PCT/US 90/04852

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: C 03 B 9/44

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	B 65 G; C 03 B

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
X	GB, A, 2126211 (UNITED GLASS PIC, (UNITED KINGDOM)) 21 March 1984, see page 1, line 121; page 2, line 97 - line 101	1-4,6-8, 14
A	US, A, 3790205 (WILLIAM WENZ) 5 February 1974, see the whole document	1-21

* Special categories of cited documents:[10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
21st November 1990	10.01.91
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	N. Tozzi Bio

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. PCT/US 90/04852

SA 40021

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 27/09/90
The European Patent office is in no way liable for theseparticulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 2126211	21/03/84	NONE	
US-A- 3790205	05/02/74	NONE	