Jan. 2, 1951 J. H. BREWER 2,536,259

FILLER TRACK

Filed March 10, 1947 2 Sheets-Sheet 1

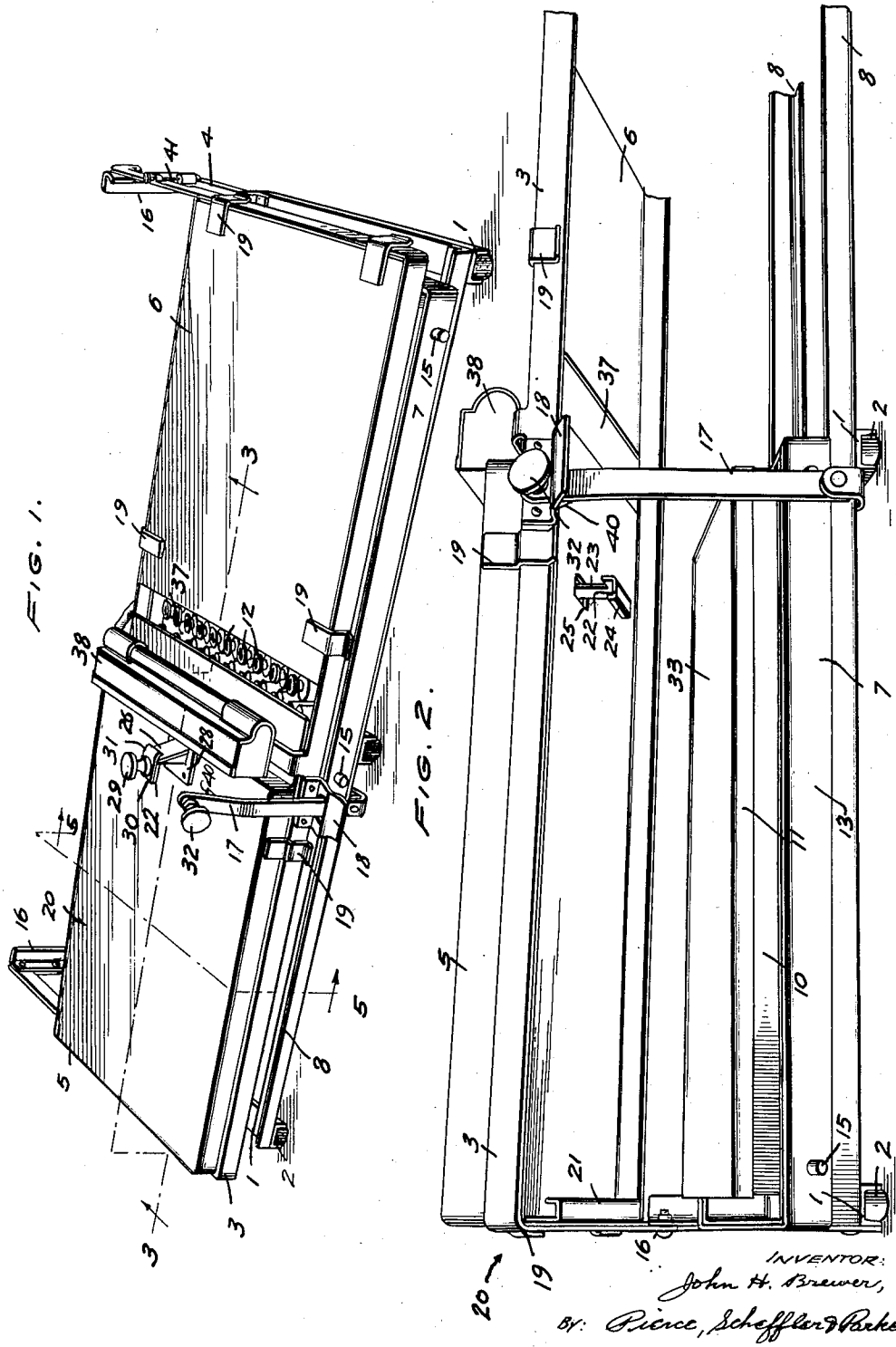


FIG. 1.

FIG. 2.

INVENTOR:
John H. Brewer,
By: Pierce, Scheffler & Parker
ATTORNEYS.

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FIG. 3.

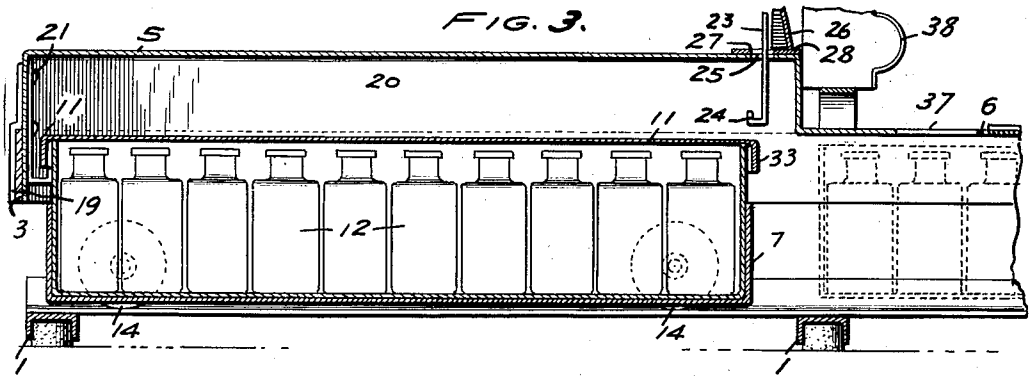


FIG. 6.

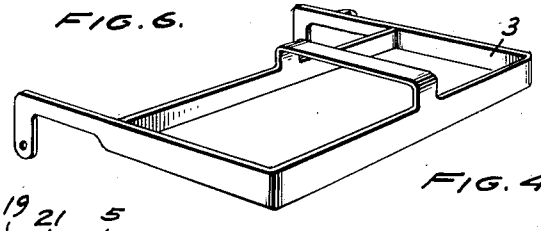


FIG. 4.

FIG. 7.

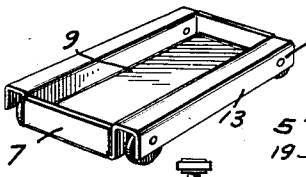


FIG. 5.

INVENTOR:
John H. Brewer,
BY: Pierce, Scheffler & Parker,
ATTORNEYS.

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UNITED STATES PATENT OFFICE

2,536,259

FILLER TRACK

John H. Brewer, Towson, Md., assignor to Hynson, Westcott & Dunning, Incorporated, a corporation of Maryland

Application March 10, 1947, Serial No. 733,700

8 Claims. (Cl. 226—129)

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The present invention relates to a device by means of which sterile containers such as ampoules, bottles, vials, etc. can be handled during the filling operation without contamination by dust from the atmosphere. More particularly, the invention concerns a manually operated device capable of receiving a lidded tray carrying a plurality of sterile containers, removing the lid from said tray, successively presenting single rows of containers to a filling station, and replacing the tray lid after completion of the filling operation.

There are in existence a number of machines for handling, sterilizing, filling and sealing bottles on a mass production basis whereby the entire series of operations is performed automatically. However, in the packaging and handling of certain biologicals such as serums, vaccines, bacterial antigens, protein extracts, etc., it sometimes is necessary to operate on a small scale basis which does not warrant the installation of automatic machines of the type referred to.

So far as I am aware, very little mechanical equipment has been devised for assisting in this work. Generally, the handling of small lot biologicals is accomplished by a group of workers equipped with face masks, rubber gloves, and sterile gowns, working in a room supplied with filtered air and purified by ultra violet light but the handling of the ampoules in the course of sterilizing, filling and sealing them is largely manual.

In the container-filling phase of this work, it is often the case that empty bottles or ampoules are delivered to the filling room in box or tray lots, each tray being covered with a lid and containing a number of sterilized unstoppered bottles arranged in rows, neck up, and accessible for filling. In order to fill the bottles, the attendant must remove the tray lid and introduce the biological into one bottle at a time by means of a pipette, or into one row at a time by means of a measuring filling device, but in either event, the open bottles are exposed to the danger of contamination from the surrounding air until such time as the tray lid is replaced and the tray is dispatched to the bottle sealing station.

I have developed a device to be presently described, by means of which the open bottles can be protected from the surrounding atmosphere during the process of filling. This device enables the attendant to present one row of bottles at a time to the filling station while keeping the remaining bottles under cover. Moreover, it does not require that the attendant open and close

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the tray under exposed conditions, but is adapted to receive a lidded tray, remove the lid from the tray, present the bottles in successive rows to the filling station, and replace the tray lid, all of these operations being accomplished within the protective cover of the device whereby the open necks of the bottles are protected against access of the foreign matter generally carried in the air.

The invention is illustrated in the accompanying drawings in which:

Fig. 1 is a perspective view of the complete device, hereinafter referred to as the filler track, with the protective cover in the closed position,

Fig. 2 is a perspective view of the filler track with the protective cover in the open position showing a lidded tray of sterile bottles in position preparatory to the opening and filling operation,

Fig. 3 is a longitudinal vertical section of the tray receiving end of the device, taken on the line 3—3 of Fig. 1,

Fig. 4 is a longitudinal vertical section of the filler track showing the details of the lid-lifting end of the track with the tray lid in the lifted position,

Fig. 5 is a transverse vertical section on the line 5—5 of Fig. 1,

Fig. 6 is a perspective view of the cover carrying frame, and

Fig. 7 is a perspective view of the carriage.

Referring to the drawings, it will be seen from Figs. 1 and 2 that the filler track consists essentially of a base member comprising angle-iron trackways 8 mounted on sills 1 in which may be inserted feet 2 of a soft material, a cover carrying frame 3 hinged to a base extension 4, removable covers 5 and 6, and a carriage 7 which travels on the longitudinal trackways 8.

As shown by Figs. 2, 5 and 7, the carriage 7 comprises a platform 9 adapted to carry a box or tray 10 having a lid 11 and containing ampoules, bottles, or vials 12, and fenders 13 covering wheels 14. Operating handles 15 extend from the fender on the side opposite cover hinge 16 to the exterior of the filler track assembly and function as the means whereby the attendant may move the carriage along the track.

The cover-carrying frame 3 may be raised or lowered by cover lift handle 18, and when it is desired that the cover remain in the raised or open position the cover handle is engaged with shoulder 40 mounted near the upper end of cover latch 17. The cover members 5 and 6 are removably mounted by means of fingers 19, on the

cover carrier at the lid-lifting and filling ends respectively.

The cover 5 for the lid-lifting end 20 of the device carries a lid-retaining hook 21 at its outer end. Mounted near the opposite end of this cover and extending through the cover is a lid-lifting hook 22. The construction and function of the lid-lifting hook may be understood from Figs. 4 and 5 in which 23 represents the shaft of the hook, 24 is the hook proper mounted on the lower end of the shaft, and 5 is the cover with an aperture 25 through which the shaft passes. Mounted on the cover is a hook support 26 which has an aperture 27 in its base 28 centered over the cover aperture 25. The upper end of the lid-lifting hook shaft is provided with an operating knob 29 and a catch member 30. When the lid-lifting hook is to be latched in the raised position, the catch member is placed over the hook support 26 and is held in position by a lip 31 on the end of the catch member.

When a tray of sterile bottles is to be filled, the device is operated as follows:

The cover lift handle 18 is raised until it engages with the shoulder 40 of latch 17, whereby the cover-carrying frame and cover of the filler track are retained in the open position. The lidded tray 10 with a lid 11 and containing the sterile empty bottles is then placed on the bed of the carriage 7, the carriage having been previously moved to a position in the lid-lifting end 20 of the filler track. Since the lid-retaining hook 21 must be able to clear the end of the tray when the filler track cover is closed, it is of course important that a space, say ½ to 1 inch, be left between the end of the tray and the end of the track when the tray is placed on the carriage. The operator now disengages the cover-holding latch by pulling on the knob 32 at the end of the latch 17, and closes the protective cover by lowering the cover lift handle 18 until the cover carrier 3 is seated by means of the adjustable stop 41. During the above described operations, the lid-lifting hook 22 is in the latched or "up" position so that when the protective cover is lowered the hook will not strike the tray lid.

The cover having been closed, the operator now moves the carriage 7 to the extreme end of the track, whereby one end of the tray 10 will be brought to bear against the lid-retaining hook 21. This is accomplished by manual movement in the desired direction of one of the operating handles 15. The tray is now in position to have its lid lifted, since one end is bearing against the lid-retaining hook and the other end is within reach of the lid-lifting hook and the entire unit is under a protective covering.

To raise the lid 11 free of the tray, the operator disengages lid-lifting hook 22 from its support 26 by grasping and raising the knob 29. He then lowers the hook by sliding it down through the aperture, engages the end flange 33 of the tray lid, and lifts that end of the lid until the hook is in position to be latched. While one end of the lid has been lifted, the opposite end has been lowered until its flange 35 is in engagement with the lid-retaining hook 21 due to the fulcrum action of end flange 39 of the tray on the tray lid at the point 36. The lid now being in the position shown in Fig. 4, the tray is free to move out from under it. This the operator accomplishes by moving the operating handle, which moves the carriage until the first row of bottles is exposed at the filling slot 37. The slot being the only position at which the bottles are subject to contamination by foreign matter, an ultra violet light 38 is mounted to radiate on this opening and sterilize any matter which may be suspended in the air passing in the opening.

When the first row of bottles has been filled, the operator merely moves the carriage again to expose the second row, and so on until all the rows have been presented for filling. The carriage is then returned to the lid-handling end of the track, whereupon the operator replaces the tray lid in a reversal of the lid-lifting procedure. The track cover is again lifted to the open position, the lidded-tray of filled bottles is removed, and the filler track is ready to receive another tray of sterile bottles.

While for the sake of clarity, I have described a simple form of my device by means of which sterile bottles in box lots may be filled with biologicals without contamination, it is obvious that many modifications of the device may be made without departing from my invention. I may for instance provide the base with a floor of sheet metal to close the space between the trackways. It is also possible to provide air tight gaskets at all seams and joints, and I may cover the filling slot with a transparent plate having built-in filling nozzles. In another modification, I may equip my filler track so that it may be evacuated prior to removal of the box lid, or it may be designed with connections whereby it can be flushed out with a sterilizing gas before the lid is removed from the box of bottles.

It is obvious that the component members may be constructed of any suitable material. I prefer to use a highly polished stainless steel which is not prone to cause adherence of foreign matter and which may be sterilized frequently without noticeable deterioration. Also for facility in sterilizing, I have provided the covers, carriage, etc., in a design allowing ready removal of the parts for sterilizing when necessary.

It will be apparent that my invention may be embodied in apparatus of very simple form. For instance, I may dispense with the use of a base and track as disclosed above, merely employing a table top as the base in combination with a carriage and a separate cover member. Obviously, by placing the carriage on the table top, locating the lidded tray on the carriage, and then positioning a cover over the carriage, I may carry out the lid removing, bottle filling, and lid replacing operations as described above. The cover member in this case may be of any suitable simple design so long as it provides adequate protection from the atmosphere of the room and is provided with the lid-lifting means and filling slot. Likewise, it will be apparent that it is not necessary that the lid-retaining hook be carried by the cover, and it will function properly if mounted, for instance, on the base member.

I claim:

1. A device comprising a base, a hinged cover for said base, and means mounted on said cover comprising a stationary retaining hook and an oppositely disposed lifting means adapted for lifting movement relative to said cover, said hook and said lifting means being adapted to engage the lid of a tray positioned beneath said hinged cover when it is closed.

2. Apparatus for handling open receptacles to minimize entry of impurities from the surrounding atmosphere comprising a tray adapted to carry a plurality of containers, a lid for said tray, a support for said tray, a cover positioned over said tray, stationary means associated with

said cover adapted to engage one end of said tray lid, and movable means associated with said cover adapted to engage and lift the opposite end of said lid, said movable means comprising a shaft movably mounted through an opening in said cover, a hook on the lower end of said shaft for engaging an edge of said lid at said opposite end, and means for securing said shaft in an elevated position.

3. A device for handling and filling sterile bottles in box lots under sterile conditions comprising an elongated base, a carriage movable back and forth on said base adapted to receive and carry a lidded tray of sterile bottles, and a cover adapted to cover said base, said carriage, and a tray carried on said carriage and means carried by said cover for lifting the tray lid free of said tray and replacing said tray lid when subjected to manipulation exterior of said cover when said cover is closed.

4. A device as defined in claim 3 wherein the means carried by said cover includes a member extending through the cover for engaging and lifting one end of the lid of the bottle tray and for supporting said lid free of the bottle tray while the latter is moved lengthwise of the base during the filling operation.

5. A device as defined in claim 3 wherein the means carried by said cover includes a member adapted to engage one end of said lidded tray positioned on said carriage and to support the tray lid at said end when the opposite end of said lid is elevated and means for engaging and elevating, said opposite end of said lid, whereby said tray lid may be lifted free of said tray.

6. A device adapted to handle sterile receptacles in the operation of filling the receptacles under protective conditions comprising an elongated base, a carriage positioned upon and movable along said base, a tray positioned on said carriage, a lid for said tray, a cover member

adapted to cover said tray, said carriage, and said base, and means mounted on said cover adapted to engage and support said lid clear of said tray.

7. Apparatus for handling sterile containers under protective conditions during the filling operation comprising a base, a carriage movable on said base, a tray adapted to carry a plurality of sterile containers and to ride on said carriage, a lid for said tray, a protective cover positioned over said base and said carriage, stationary means associated with said base for engaging and supporting one end of the tray lid, movable means associated with the cover adapted to engage and lift the opposite end of the tray lid, and means adapted to secure said movable means in an elevated position.

8. Apparatus comprising an elongated base, a carriage movable longitudinally along said base, a tray adapted to be carried by said carriage, a lid for said tray, a cover for said base and carriage, a lid-retaining hook mounted on the interior of said cover and stationary with respect to said cover, a lid-lifting hook support associated with said cover and a lid-lifting hook carried by said cover and oppositely disposed to said lid-retaining hook, said lid-lifting hook comprising a shaft extending through an aperture in said cover, a hook member associated with one end of said shaft, and an operating knob and a catch member associated with the opposite end of said shaft.

JOHN H. BREWER.

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The following references are of record in the file of this patent:

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