P. C. LIEBER.

PACKAGE FILLER.

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Fig. 1.

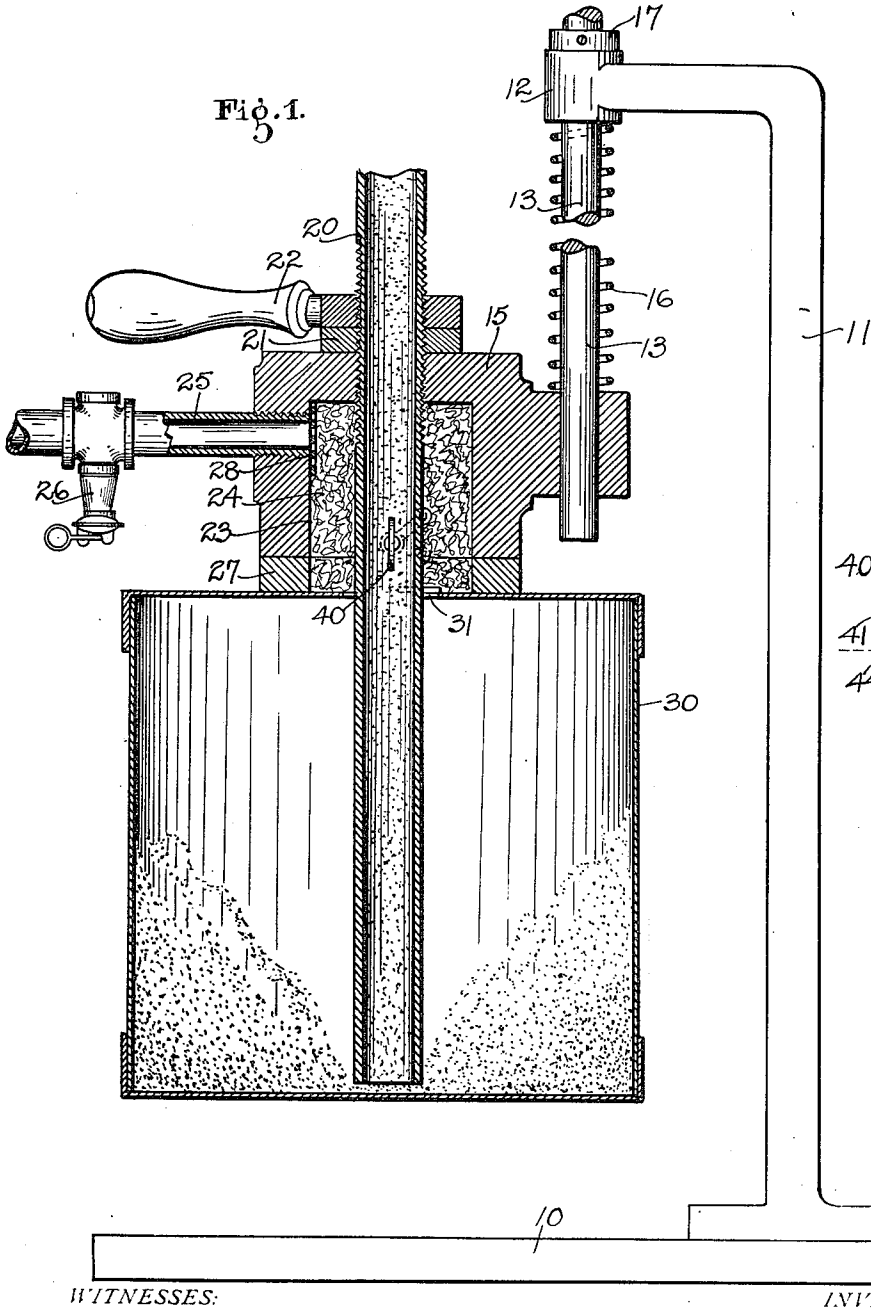
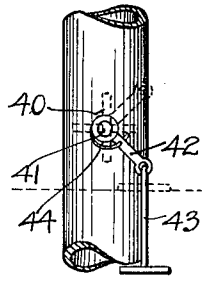


Fig. 2.



WITNESSES:

A H Edgerton

O. M. McLaughlin

INVENTOR.

PETER CARL LIEBER.

BY

W. H. Lockwood

ATTORNEY.

UNITED STATES PATENT OFFICE.

PETER CARL LIEBER, OF INDIANAPOLIS, INDIANA.

PACKAGE-FILLER.

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To all whom it may concern:

Be it known that I, PETER CARL LIEBER, a citizen of the United States, and a resident of Indianapolis, county of Marion, and State of Indiana, have invented a certain useful Package-Filler; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

The object of this invention is to provide mechanical means for the safe filling of boxes, cans and other packages with powder-like substances.

The invention has been designed with particular reference to filling packages with poisonous substances in powdered form, such as arsenic, Paris-green and the like. On account of the highly poisonous character of the substances it is important that the said substances be kept away, as much as possible, from the operator, and also that the powder be prevented from flying into the air whereby the same will be breathed by the operator. Heretofore the filling of packages with such substances has been very serious and dangerous to the health of the operators.

The chief feature of this invention consists in combining with the filler, means for removing the air that escapes from the box or package. This is done through an air exhaust apparatus.

Another feature of the invention is the use of the air exhaust apparatus for supporting the package while being filled and adjusting the exhaust so that when a predetermined quantity, say one pound, of the substance has entered the package, the latter will drop automatically away from the filler.

The nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings, Figure 1 is a central vertical section through the device showing a can being filled. Fig. 2 is a side elevation of a portion of the filler tube, showing the valve for closing the same.

There is shown herein a table 10 or any suitable support and on it there is mounted an upright 11 having an apertured sleeve 12 through which a rod 13 vertically reciprocates. It is immaterial how the sleeve 12 is mounted so long as it is stationary. The rod 13 has secured to it a suction head 15 and a spring 16 is coiled about the rod between the sleeve 12 and suction head 15 so as to tend to force the suction head downward as far as a stop collar 17 on the rod 13 above the sleeve 12, will permit.

A filling tube 20 extends vertically through the suction head some distance below the same and also for some distance above the same. It leads from some hopper or other means, not shown, for holding the supply of powder-like material with which the can or box is to be filled. The tube 20 is screwed in the suction head so that it can be vertically adjusted with reference to the suction head and it is held in place by a lock nut 21 and handle 22 whereby the suction head is elevated against the action of the spring 16. There is a relatively large chamber at 23 within the suction head and surrounding the tube 20 which is filled with filtering material 24. There is a rubber ring 27 secured to the underside of the suction head with a central opening continuing the chamber 23 down to the underside of the rubber ring. The chamber 23 is thus open at the bottom and the filtering material extends down to the bottom. An exhaust pipe 25 leads from the chamber 23 to some exhausting means, not shown. There is a metal screen 28 at the inner end of the tube 25. There is a pressure regulator 26 connected with the tube 25 whereby the force of the exhaust can be regulated and predetermined.

The can or paper box 30 is provided with a hole 31 centrally located in the top for the insertion of the filling tube 20. The diameter of the hole 31 should be slightly greater than the diameter of the tube so that there will be an air space around the tube for the exhaustion of the air from the can or box. The tube 20 is adjusted vertically so that when the can or box is lifted up against the bottom of the suction head, the lower end of the tube 20 will extend almost down to the bottom of the can or box. The suction head is supported by the collar 17 when the head is in its lowered position but the head may be upwardly moved against the action of the spring 16 to a sufficient distance above the table 10 to enable the can or box to be slipped under the tube 20.

The operation is as follows: The exhaust may operate continuously. When the suction head is in its elevated position, the can or box is placed on the table 10, slipped under the suction head so that the opening 31

in the top of the can or box will be under the tube 20. Then the suction head is lowered as far as the collar 17 will permit and at the same time the can or box is elevated so as to bring its top against the rubber and filter at the bottom of the suction head. The filler tube will then extend almost to the bottom of the can or box and the powder-like material is through suitable means, not shown, discharged through said tube into the can or box. At the same time that the exhaust apparatus is in action and powder enters the bottom of the can or box, the air is exhausted from the upper end of the can or box. The powder will accumulate in the box until it amounts to the predetermined weight which is sufficient to overcome the suction action of the exhaust. Then the can or box drops by gravity upon the table 10. Any escaped powder will be drawn by the exhaust into the filtering material 24 and it will not escape into the open air. At the same time the supply of powder-like substance in the tube 20 is stopped and the suction head elevated and the can or box slipped laterally away from the tube 20, a sticker or adhesive paper, not shown, is immediately placed over the opening 31 of the can or box, and thereafter no powder can escape from the can or box and another can is immediately placed in the machine.

It will be obvious that the tube 20 must extend down close to the bottom of the can 30 so that when the can drops but little space will be left around the tube at the opening 31, thus preventing a heavy discharge of powder from the can at the time of release, any discharge which may take place being drawn into the filtering material by the action of the suction means. It will also be obvious that the weight of material deposited in the can 30 before the latter drops will always be equal because the difference between the upward pressure of the atmosphere on the bottom of the can and the downward pressure of the atmosphere on the top of the can will always be uniform when the can is being filled since the suction is kept uniform by the valve 26.

To prevent the powder-like material from escaping from the filler-tube 20 after the can or box is filled, a valve 40, like a butterfly valve, is located within said tube 20 at the lower end of the suction head on a shaft 41 projecting out of the tube and having an arm 42 thereon with a suspended bar 43 extending downward in position to be engaged by the can or box 30 as it is moved upward into place. Such upward movement of the bar 43 with the can or box, would open the valve to the position shown in Fig. 1. A spiral spring 44 on the shaft 41 will close the valve as soon as the can or box is dropped down or is removed. Where it is preferred to have the filler tube 20 readily adjustable vertically in the suction head, the valve 40 should be omitted and other means employed for closing the tube 20.

I claim as my invention:

1. A package filler including a tube adapted to enter the package and through which the latter is filled, a suction head surrounding the tube and adapted to engage the top of the package being filled and having an exhaust chamber through which the tube extends, and filtering material in said chamber.

2. A package filler including a tube insertible in the package to be filled and through which the material enters the package, a vacuum head surrounding said tube, a layer of yielding material on the underside of the head and adapted to engage the top of the box when being filled, filtering material in said chamber and layer of yielding material and surrounding the tube, and means for exhausting air from said chamber.

3. A package filler including a vacuum head, means for supporting the same so that it is vertically movable, a spring tending to force it downward, a filler tube extending through the vacuum head, and means for exhausting air from the vacuum head.

4. A package filler including a frame, a vertically movable rod therein, a vacuum head secured to said rod, a spring tending to force said rod and vacuum head downward, a filler tube extending through the vacuum head, and means for exhausting air from the vacuum head.

5. A package filler including a vacuum head, means for supporting the same so that it is vertically movable, a spring tending to force it downward, a filler tube extending through the vacuum head, means for exhausting air from the vacuum head, and means for limiting the downward movement of said vacuum head.

6. A package filler including a frame, a vertically movable rod therein, a vacuum head secured to said rod, a spring tending to force said rod and vacuum head downward, a filler tube extending through the vacuum head, means for exhausting air from the vacuum head, and a stop on said rod for limiting its downward movement.

7. A package filler including a tube insertible in a reduced opening formed in the top of the package and of less diameter than said opening, a vacuum head carrying said filler tube and surrounding the same in position to engage the top of the package, means for exhausting air in the portion of the vacuum head surrounding said tube and above said opening and means for maintaining a uniform degree of vacuum in the vacuum head while the package is in filling position.

8. A package filler including a tube insertible in a reduced opening formed in the

top of the package and of less diameter than the opening, a vacuum head surrounding and carrying said filler tube and adapted to engage the top of the package and having a chamber in communication with a portion of the opening in the chamber surrounding said tube, filtering material in said chamber, means for exhausting air from said chamber, and means for maintaining a uniform degree of vacuum in the vacuum head while the package is in filling position.

9. A package filler including a vacuum head for holding the package in filling position so that said package will drop away when it contains material of sufficient weight to overcome the lifting effect of the suction, and means for maintaining a uniform degree of vacuum in the vacuum head while the package is in filling position.

10. A package filler including a vacuum head for supporting the package in filling position, means for exhausting air from said vacuum head, and means for regulating said exhaust whereby the package will drop away from the suction head when it reaches a certain weight.

11. A package filler including a filler tube through which the material passes to the package, a suction head surrounding the filler tube for supporting the package, means for exhausting air from the suction head, and means for relieving said exhaust whereby the package will drop away from the suction head when it reaches a certain weight.

12. A package filler including a tube adapted to be inserted in the package and through which material enters the package, a suction head surrounding said tube and adapted to engage the top of the package when being filled for exhausting air from the opening in the top of the package surrounding the tube, a shaft extending into the filler tube, a valve thereon for closing said tube, a spring on said shaft for turning the valve to a closing position, an arm extending from said shaft, and a bar pivotally connected to said arm and hanging downward in position to be engaged and vertically actuated by the package when moved into filling position for opening the valve.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

PETER CARL LIEBER.

Witnesses:
J. H. WELLS,
E. H. MAYO.