

No. 642,640.

Patented Feb. 6, 1900.

D. SMITH.

TUBE FILLING APPARATUS.

(Application filed June 12, 1899.)

(No Model.)

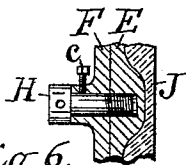
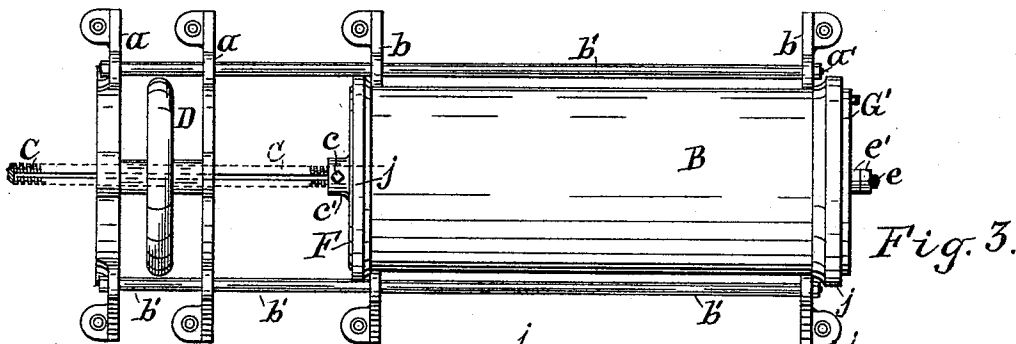
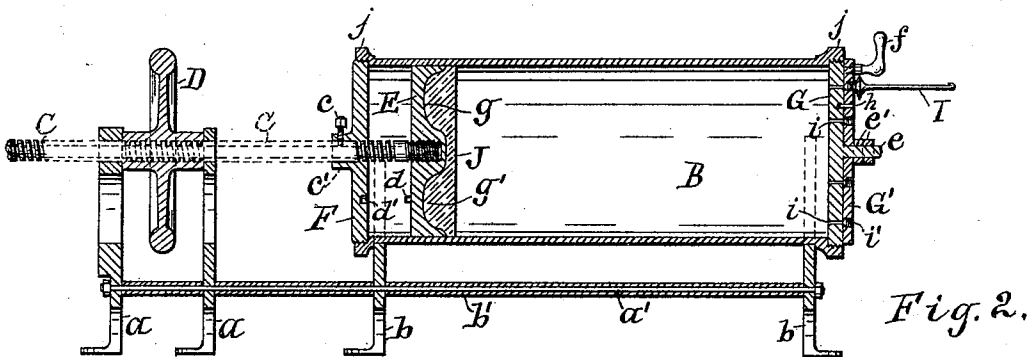
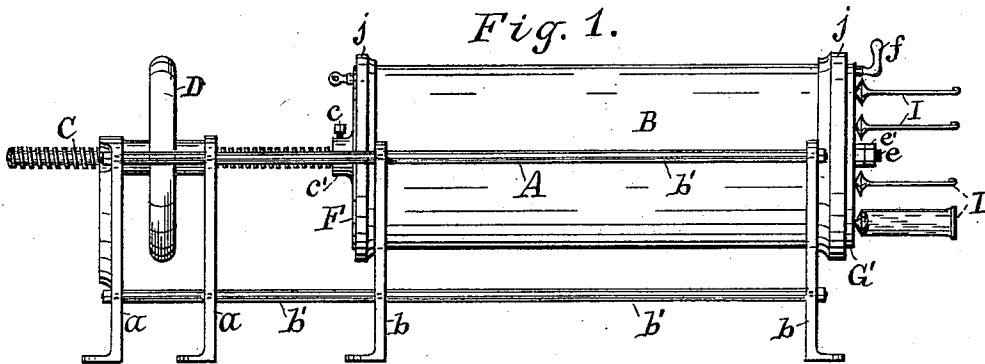


Fig. 6.
Witnesses.

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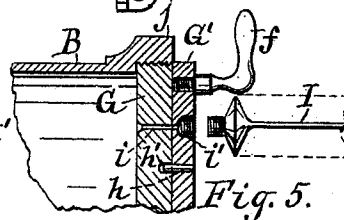
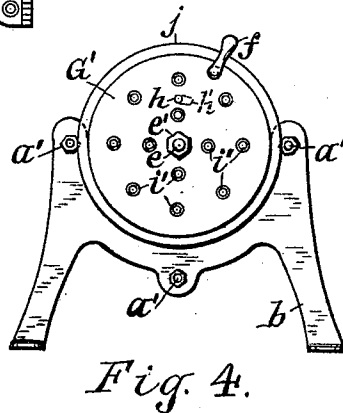


Fig. 5.
Inventor.

Darius Smith
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UNITED STATES PATENT OFFICE.

DARIUS SMITH, OF SYRACUSE, NEW YORK.

TUBE-FILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 642,640, dated February 6, 1900.

Application filed June 12, 1899. Serial No. 720,147. (No model.)

To all whom it may concern:

Be it known that I, DARIUS SMITH, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful

Improvements in Tube-Filling Apparatus, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to means for filling compressible or ductile tubes with a sterilized substance, such as "steriline;" and the object is to provide a simple and effective apparatus that may be easily operated, retains the substance in a heated condition without exposure to the air, and that will fill several tubes at the same time and successively without waste of the substance.

The tubes to be filled are ductile and are commonly known as "paint" tubes, though any suitable tubes may be used. Said tubes are preferably closed at one end by a fold and at the other end by a screw-cap which has a smaller diameter than the tube.

My invention consists in the combination with a frame, a cylinder loosely mounted on the frame and provided with a plunger, an end for the cylinder provided with a central orifice, a screw-threaded rod passing through said orifice and connected to the plunger, a wheel or equivalent part having an internally-threaded hub mounted on said rod between two standards of the frame to operate the plunger, a perforated end for the opposite end of the cylinder, and a revoluble disk on said end having screw-threaded orifices adapted to receive the threaded ends of the tubes and register with the perforations in the said perforated end; and my invention consists in certain other combinations of parts hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a side elevation of my invention. Fig. 2 is a central longitudinal sectional view of the same. Fig. 3 is a top plan view. Fig. 4 is a view of the apparatus looking from right to left of the above-mentioned figures. Fig. 5 is a fragmentary view, enlarged, showing a single perforation or outlet in the end plate and threaded orifice for the reception of a tube in the revoluble disk; and Fig. 6 is an

enlarged sectional view of a fragment of the opposite end of the cylinder with the plunger in contact with it, said parts being secured together by a screw passing through the orifice.

Referring specifically to the drawings, A is the frame, having four vertical standards *a a* and *b b*, connected together by several rods *a'*, passing horizontally through the standards, and pipes *b'* on the rods to hold the standards securely the proper distance apart. The standards *b b* have their upper ends concaved to receive and support the cylinder B, which is loosely supported thereon in a horizontal position, so that it may be easily separated from the frame when desired. Said cylinder is held from longitudinal movement while in the frame by integral beads or flanges *j j* at opposite ends which are in contact with the standards *b b* between them. The standards *a a* are extended upward to support the screw-threaded rod *c*, connected with the plunger E, within the cylinder, and are provided with orifices through which the said rod passes. A hand-wheel D, having an internally-threaded hub, is mounted on the rod C between the standards *a a* to reciprocate the rod and plunger. The rod is provided with coarse thread throughout its length, except at the end which enters the center of the plunger E, and has a longitudinal groove in its upper side which receives and is engaged by a small screw *c*, passing through a flange *c'* on the end F of the cylinder B, which prevents the rod and plunger from rotating during the operation.

I do not wish to be limited to the precise form or construction of the frame or hand-wheel, as these may be modified without departing from my invention.

When the hand-wheel is turned in one direction, the plunger will be moved toward the perforated end G of the cylinder and the contents therein will be forced through the perforations *i* and through the small threaded orifices *i'* in the revoluble disk G' into the tubes I, having their threaded ends secured in the orifices, as shown in Fig. 1 of the drawings. When the hand-wheel is turned in the opposite direction, the plunger E is moved to contact with the end F. When in this position, a small projection *d* on the plunger lies in a recess *d'* in the inner side of the end F, and

by this means the rod C may be turned out of the plunger after the screw C is withdrawn from the groove of the rod without turning the plunger. After the removal of the rod C the screw H (shown in Fig. 6) is inserted without turning the plunger, and the latter is thereby secured to the end F. The cylinder B may then be removed from the frame and refilled with any desired substance to be heated or sterilized. To refill the cylinder, the end G, together with the disk G', is removed from the cylinder. After the cylinder is filled the end G is again applied, the perforations therein being closed by the disk G'.

The cylinder, with its contents, is then heated by steam or otherwise to 250°, more or less, which thoroughly sterilizes the contents. The cylinder is then placed on the frame A, the screw H is removed, and the rod C is connected with the plunger. Then the ductile tubes I, which have been previously flattened, as indicated in the drawings, to exclude the air, are inserted in the threaded orifices of the revoluble disk. Any desirable number of such orifices *i'* may be placed in the disk corresponding to the number of perforations or outlets *i* in the end G. The disk G' is mounted on a stud *e*, projecting from the center of the outer face of the end G. A pair of nuts *e'* on the stud hold the disk in close contact with the end. The disk G' is a cut-off for all of the outlets and it is rotated by means of the handle *f*. When the disk is turned to open the outlets, the hand-wheel is turned to force the threaded rod and plunger toward the perforated end, which operation forces the contents into the tubes I. When the tubes are filled, the disk is turned to close the outlets and the tubes are removed from the disk and capped while hot. Another series of flattened tubes is connected to the disk and the operation is repeated until the sterilized substance is entirely removed from the cylinder.

In order that the sterilized substance will not pass back of the plunger during the operation or between the periphery of the plunger and the inner side of the cylinder, I provide the inner face of said plunger with a circular recess *g*, which receives a circular projection *g'* on one face of a disk of cork J or analogous material the same diameter as the plunger. When pressure is applied to the plunger and cork disk to expel the material, the cork expands sufficiently to prevent completely any of the substance passing between the cork disk and the cylinder.

In order to limit the movement of the disk G', I secure a pin *h* in the disk to project into a short groove *h'* in the outer face of the end G, the parts being indicated in Figs. 4 and 5 of the drawings.

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

1. In an apparatus for filling compressible tubes, the combination with a frame, a cyl-

inder mounted on the frame and provided with a plunger, an end for the cylinder provided with a central orifice, a screw-threaded rod passing through said orifice and connected to the plunger, a wheel having an internally-threaded hub mounted on said rod between parts of the frame to operate the plunger, a perforated end plate for the opposite end of the cylinder, and a revoluble disk on said end having screw-threaded orifices adapted to receive the threaded ends of the compressible tubes and also adapted to register with the perforations in the said perforated end plate, as set forth.

2. In an apparatus for filling compressible tubes, the combination with a frame, a cylinder, removably mounted on the frame and provided with a plunger, an end for the cylinder provided with a central orifice, a screw-threaded rod passing through said orifice and connected to the plunger, a wheel having an internally-threaded hub mounted on said rod between parts of the frame to operate the plunger, a perforated end plate for the opposite end of the cylinder, and a revoluble disk on said end having screw-threaded orifices adapted to receive the threaded ends of the compressible tubes and also adapted to register with the perforations in the said perforated end plate, as set forth.

3. In an apparatus for filling compressible tubes, the combination with the frame having standards provided with cavities, a cylinder supported in a horizontal position in said cavities and having flanges at the opposite ends to bear upon the standards, a plunger within the cylinder, an end for the cylinder provided with a central orifice, a screw-threaded rod passing through said orifice, and connected to the plunger, a wheel having an internally-threaded hub mounted on said rod between parts of the frame to operate the plunger, a perforated end plate for the opposite end of the cylinder, and a revoluble disk on said end having screw-threaded orifices adapted to receive the threaded ends of the compressible tubes and also adapted to register with the perforations in the said perforated end plate, as set forth.

4. In an apparatus for filling compressible tubes, the combination with the frame comprising a pair of standards with cavities, and another pair of standards, said standards being rigidly connected together and suitably spaced apart by horizontal rods, a cylinder having flanges at opposite ends supported in a horizontal position in the said cavities, a plunger within the cylinder, an end for the cylinder provided with a central orifice, a threaded rod passing through said orifice and connected to said plunger, a wheel having an internally-threaded hub mounted on said rod between one pair of standards of the frame, a perforated end plate for the opposite end of the cylinder, and a revoluble disk on said end having screw-threaded orifices adapted to receive the threaded ends of the compressible

tubes and also adapted to register with the perforations in the said perforated end plate, as set forth.

5. In an apparatus for filling compressible tubes, the combination with a frame, a cylinder mounted on the frame and provided with a plunger having a circular cavity in its front face, a disk of cork or analogous material having a circular projection extending within the cavity of the plunger, an end for the cylinder provided with a central orifice, a screw-threaded rod passing through said orifice, and connected to the plunger, a wheel having an internally-threaded hub mounted on said rod between parts of the frame to operate the plunger, a perforated end plate for the opposite end of the cylinder, and a revoluble disk on said end having screw-threaded orifices adapted to receive the threaded ends of the compressible tubes and also adapted to register with the perforations in the said perforated end plate, as set forth.

6. In an apparatus for filling compressible tubes, the combination with the cylinder, the end having a central orifice, of the plunger, the threaded rod removably connected to the plunger, and adapted to pass through the said central orifice, said threaded rod having a longitudinal groove, the screw passing through a projection of the said end to enter the groove, a projection on the rear face of the plunger, to enter a recess in the inner face of the said end where the plunger is in contact with or in close proximity to the end, and means for securing the plunger to the end when the threaded rod is removed from the plunger, as set forth.

7. In an apparatus for filling compressible tubes, the combination with the cylinder, the plunger, and means for reciprocating the plunger, of a perforated end for the cylinder, a disk revoluble on the said end and provided with threaded orifices adapted to receive the ends of the compressible tubes, and to register with the perforations in said end, as set forth.

8. In an apparatus for filling compressible tubes, the combination with the cylinder, the plunger, and means for reciprocating the plun-

ger, of a perforated end for the cylinder, a disk revoluble on the said end and provided with threaded orifices adapted to receive the ends of the compressible tubes, and to register with the perforations in said end, means to turn the said disk, and means to limit its movement, as set forth.

9. In an apparatus for filling compressible tubes, the combination with the cylinder, the plunger, and means for reciprocating the plunger, of a perforated end for the cylinder having a central projection on its outer face, a disk revoluble on the said projection and provided with threaded orifices adapted to receive the ends of a plurality of tubes, and to register with the perforations in said end, and means to turn said disk, as and for the purpose described.

10. In an apparatus for filling compressible tubes, the combination with the frame, having a pair of standards provided with cavities, of a cylinder supported in a horizontal position in said cavities, and having flanges at opposite ends to bear upon the outer sides of said standards, a plunger within the cylinder, an end for the cylinder provided with a central orifice, a screw-threaded rod passing through said orifice, and connected to the plunger, a wheel having an internally-threaded hub mounted on said rod between a second pair of standards of the said frame to operate the plunger, a removable perforated end plate in the opposite end of the cylinder, and having a stud projecting outward from its center, a disk revoluble on the said stud and secured thereon, said disk being provided with threaded orifices adapted to receive the ends of a plurality of tubes, and to register with the perforations in said end, means to revolve said disk, and suitable means to limit its movement, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name.

DARIUS SMITH. [L. S.]

Witnesses:

L. A. WHITE,
M. T. BROWNELL.