

March 6, 1951

J. C. FESEN ET AL
 SELF-SEALING CLOSURE COMPRISING SPRING
 ACTUATED HINGED DOORS WITH KNIFE EDGES
 Filed Nov. 2, 1945

2,543,770

FIG. 1

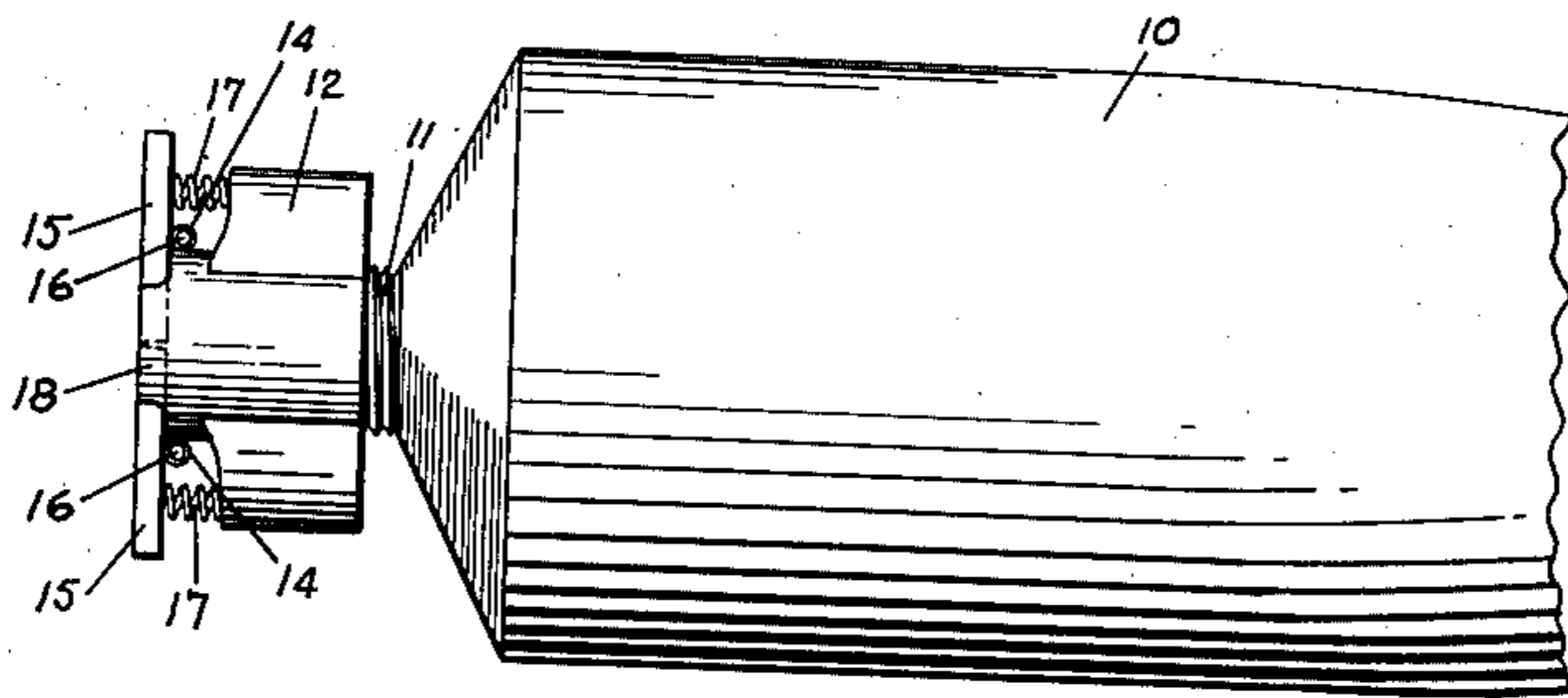


FIG. 2

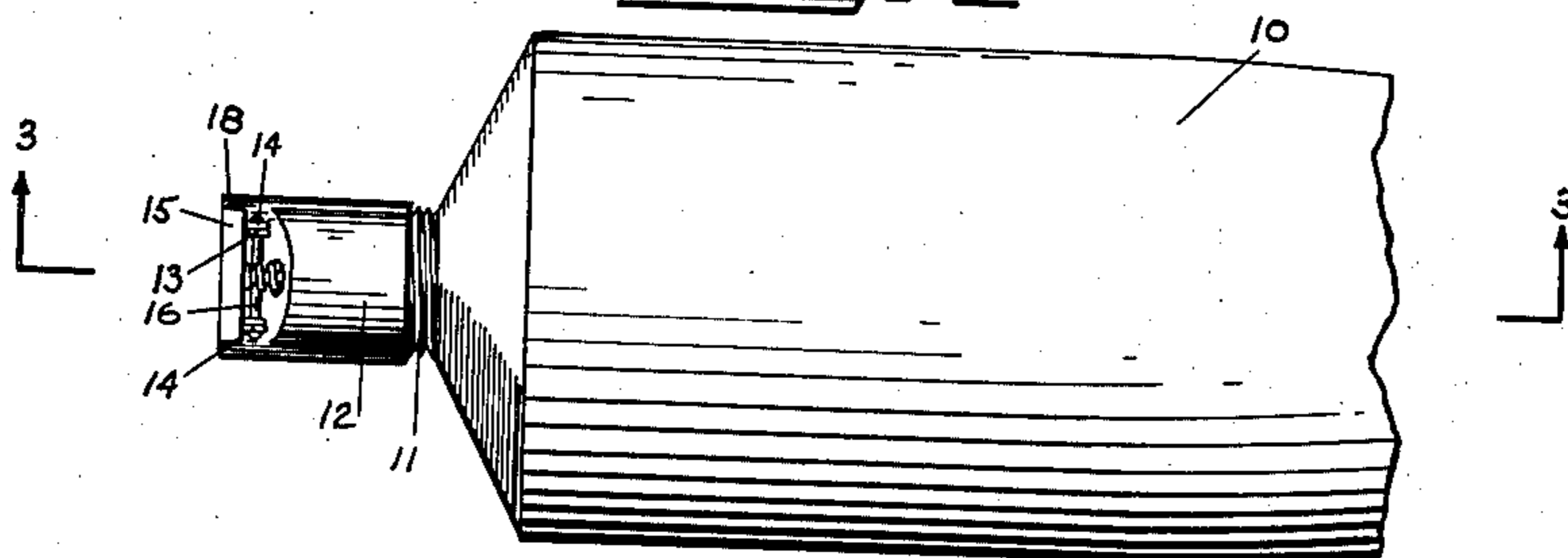


FIG. 3

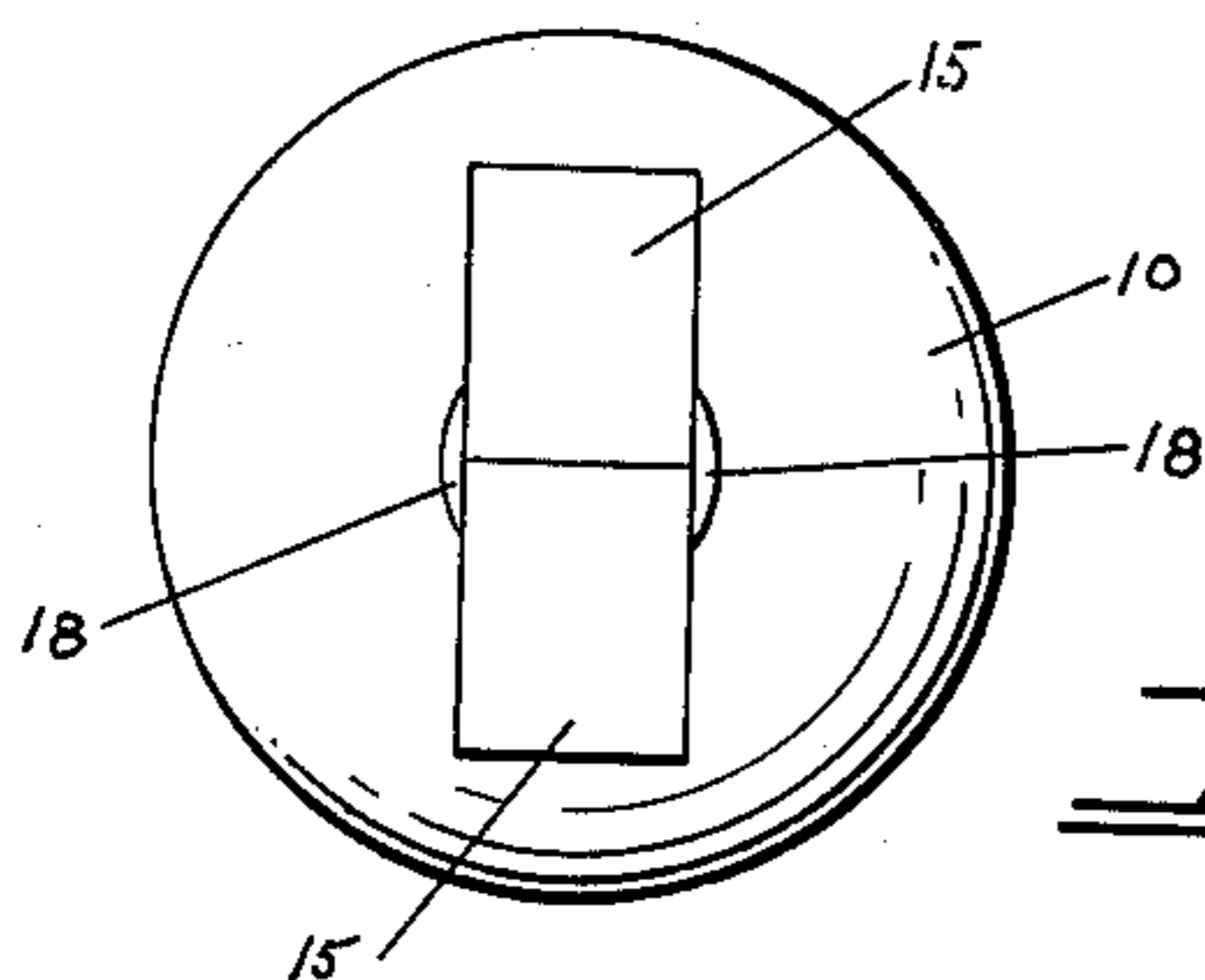
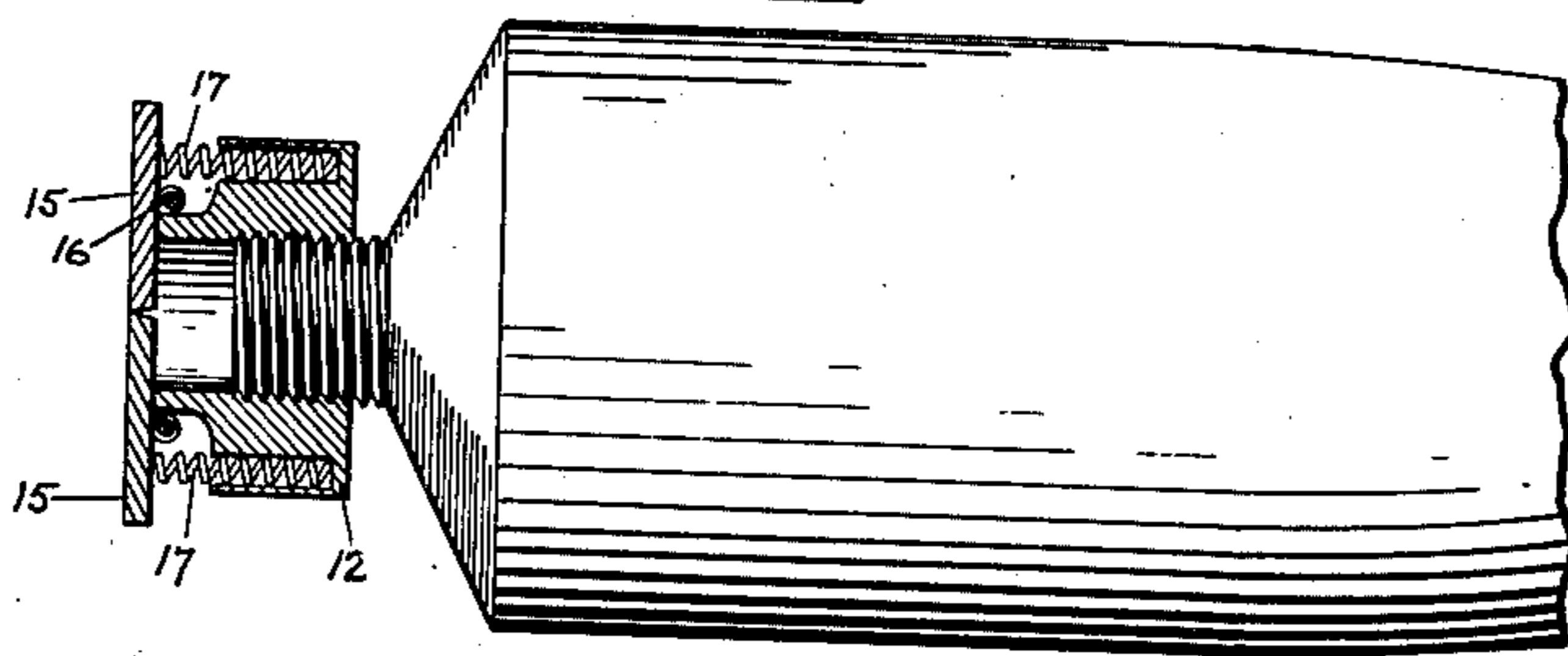


FIG. 4

INVENTORS.
 JOHN. C. FESEN &
 MORRIS GOLDSTEIN.

BY

Ralph L. Chappell

ATTORNEY.

UNITED STATES PATENT OFFICE

2,543,770

SELF-SEALING CLOSURE COMPRISING
SPRING ACTUATED HINGED DOORS
WITH KNIFE EDGESJohn C. Fesen and Morris Goldstein, United
States Navy

Application November 2, 1945, Serial No. 626,420

1 Claim. (Cl. 222—80)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

1

This invention relates to closures and more particularly to a self-closing cap for a collapsible tube.

Many substances of the type that includes semi-liquid compounds such as, for example, flammable paints and lubricants, printers' ink, cold cream, shaving cream, tooth paste, mustard, vegetable pastes, and the like, are sold encased in collapsible tubes. It is standard practice to seal an end of each collapsible container with a threaded cap which engages a threaded opening in the container. Each time that a portion of the contents of the collapsible tube is to be taken from the tube, the threaded cap must be removed. The contents of the tube are normally ejected from the tube by applying pressure upon the outer walls or surface of the tube, the cap being reengaged onto the threaded opening of the tube after the desired portion has been removed from the tube.

The removal and reattachment of the tube cap for each use of the tube entails many annoyances other than the inherent waste of time involved in such repetition. Often, especially when caps are screwed onto or from toothpaste and shaving cream encased in collapsible containers, the user's hands are moist so that the cap has a tendency to slip from his fingers, damaging, dirtying or irretrievably losing the cover. If a tube is to be used repeatedly though not continuously, there is a tendency to leave the cap cover off the collapsible tube in order to dispense with the repeated removal and reattachment of the cap. This practice is particularly dangerous when the substance in the tube is flammable. A self-closing cap which will permit a measured amount of the substance to exude from the container yet completely protect the residue in the tube from the outside environment would add considerably to the safe use of flammable substances encased in collapsible tubes.

It is an object of this invention to provide a novel self-sealing closure for collapsible tubes.

Another object is to provide a self-sealing closure adapted to cleanly clip off the measured amount of substance which is exuded from a collapsible tube.

Another object is to provide a self-sealing closure for a collapsible tube adapted to automatically force back into the tube the excess of exuded substance when pressure is removed from the outer walls or surface of the tube.

A further object is to provide a self-sealing closure that has the aforementioned characteristics yet is exceedingly simple in its operation.

2

Further objects and advantages of this invention, as well as its construction, arrangement and operation, will be apparent from the following description and claim in connection with the accompanying drawing, in which

Fig. 1 is a view in elevation of an embodiment of the present invention secured to the threaded open end of a collapsible tube.

Fig. 2 is a top or bottom view of Fig. 1.

Fig. 3 is a section along the line 3—3 of Fig. 2.

Fig. 4 is a left side of Fig. 1.

There is shown a collapsible tube 10 whose open end includes a threaded male portion 11. Detachably secured to threaded portion 11 is a tubular member 12 which is internally threaded to engage the threaded male portion 11. The tubular member 12, although illustrated as being substantially cylindrical, may be of any desired shape, designed to appeal to the eye when the tubular member is secured to tubes containing toothpaste, shaving cream and the like, or simply designed to facilitate its turning when it is secured to tubes containing lubricants, paints, industrial pastes and the like.

The tubular member 12 has two pairs of hinge eyes 13 which are integral with the member 12 as shown in Fig. 3, each pair of hinge eyes 13 coacting with another pair of hinge eyes 14 that depend from the underside of each door 15. A hinge pin 16 for each door 15 connects the door to the tubular member 12 and serves as a hinge axis about which the door 15 swings. The occluding surfaces of the doors 15 are cut to conform substantially to a V-shape when contact between the doors 15 is made, resulting in a knife edge for cleanly clipping the desired amount of exuded substance from the excess of that substance.

Compression springs 17 are partially housed in recesses cut into the tubular housing 12 as is illustrated in Fig. 3, the tops of the springs 17 being urged against the underside of each door 15. Thus there is a spring and a hinge for each door to assure a rapid and accurate return of the doors 15 to their normal position of closure soon after pressure is removed from the outer surface of the collapsible tube 10. In order to avoid side flow of the exuded substance when pressure is being applied to the outer surface of the collapsible tube, deflecting members 18 are made integral with the housing 12.

The internally threaded housing 12, the hinge eyes 13, and the deflecting members 18 are cast in one piece, using suitable material such as plastic, plastic compounds, or metal. The doors 15 may

3

likewise be cast of similar material. The strength of the housing 12, the doors 15, and the springs 17 will be commensurate with the nature of the substance contained in the collapsible tube. For instance, the springs 17 have a compression to suit the viscosity and density of the substance within the collapsible tube 10. A heavy viscous substance of a tarry nature would require stronger doors 15 and stronger springs 17 than a less viscous and less dense substance of a pasty consistency. Similarly, the strength of the hinges 13 and 14 would be commensurate with the nature of the contents of the collapsible tube 10.

The present device is simple to operate, can be manufactured in various sizes and of materials of different strength to suit particular requirements, and is universally applicable to collapsible tubes. With slight and obvious modifications, the self-sealing closure can be adapted to engage an opening which is not threaded by using a suitable snap-on spring near the base of the housing 12.

It is to be understood that various modifications and changes may be made in this invention without departing from the spirit and scope thereof as set forth in the appended claim.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

A closure for a dispensing device having an outlet, said closure comprising a body having an opening in alignment with the outlet and defining a path of flow, a pair of independent doors

4

mounted in opposed relation on said body, a pair of hinges on said body on opposite sides of the path of flow for individually mounting said doors for rotary movement relative to said body and a limiting position, said doors in their limiting position extending transversely across the path of flow to close the opening, said doors having knife edges which mate in the limiting positions with the opening closed, a pair of deflecting members disposed along opposite sides of said doors and adapted to seal the mating ends of said knife edges when said doors are in the limiting position with the opening closed, and a pair of compression springs disposed one between each door and said body on the side of the door hinge away from the path of flow, said springs yieldingly urging said doors into the limiting position to close the opening.

JOHN C. FESEN.
MORRIS GOLDSTEIN.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,106,885	Miller	Aug. 11, 1914
1,840,194	Hahn et al.	Jan. 5, 1932
2,005,642	Thornton	June 18, 1935
2,260,763	Auditore	Oct. 28, 1941

FOREIGN PATENTS

Number	Country	Date
159,004	Switzerland	Feb. 16, 1933