Jan. 10, 1956 A. R. SABAROFF ET AL 2,730,254

PACKAGE OPENER

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Fig. 1.

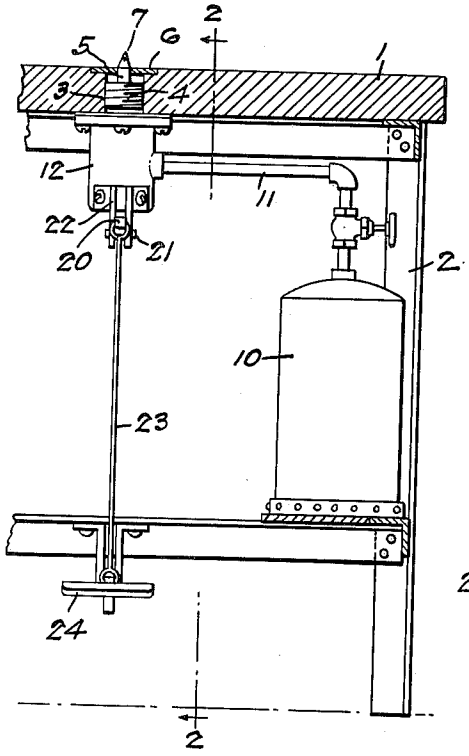
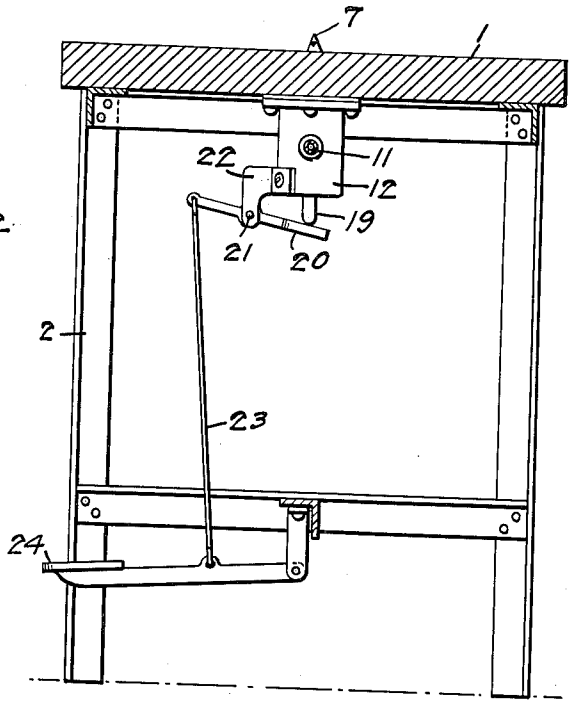


Fig. 2.



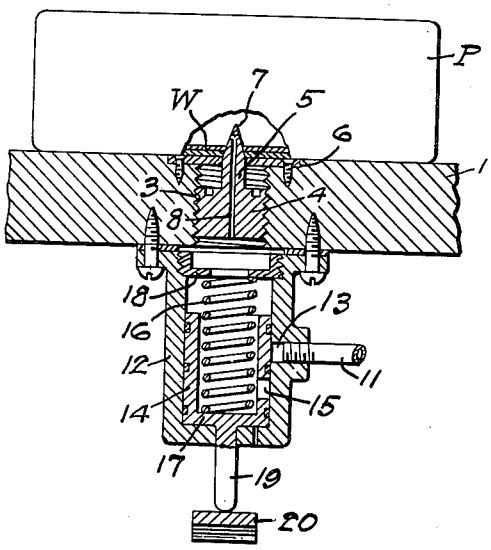


Fig. 3.

Fig. 4.

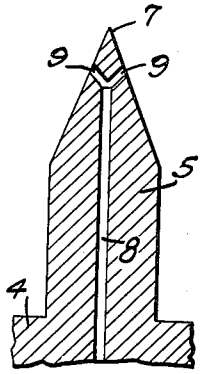
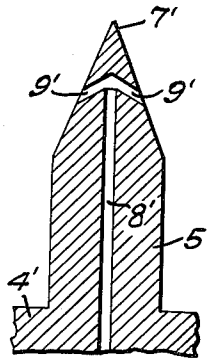


Fig. 5.



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PACKAGE OPENER

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4 Claims. (Cl. 214—305)

(Granted under Title 35, U. S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to us of any royalty thereon.

This invention relates to a package opener and method and, more particularly, to one which will quickly open sealed packages.

An object of the invention is to provide a device which will force compressed air into a sealed package after puncturing the wrapper of said package or carton.

Another object of the invention is to provide a sharpened nozzle having air outlets for admitting compressed air to the interior of a sealed package to rupture the wrapper quickly.

Another object of the invention is to provide a nozzle which can be adjusted to a predetermined distance above the table top to insure a puncture of a necessary depth without damaging the contents of the package.

A further object of the invention is to provide a device and method by which it is possible to hold the package in close contact with the table top and the nozzle, to effect a minimum escape of air around the nozzle.

A still further object of the invention is to provide interchangeable nozzles having different types of fluid pressure outlets as required for different types of sealed packages.

Other objects and advantages will be apparent from the following detailed description and the accompanying drawings, in which:

Figure 1 is a sectional view of a work table with which the present invention is assembled;

Figure 2 is a sectional view on the line 2—2 of Figure 1;

Figure 3 is an enlarged sectional view of one type of valve and nozzle which may be used;

Figure 4 is a further enlarged sectional view of one form of nozzle;

Figure 5 is a view similar to Figure 4 showing a different form of nozzle.

The large amount of savings in time and labor by using this method of opening sealed packages or cartons is difficult to estimate, and can only be determined by the number of such packages that must be quickly opened in connection with a production program.

It is estimated that about 70% of sealed cartons can be opened by this method, and it should be here stated that the better the seal the more quickly the carton is ruptured.

The present invention is not limited to size, therefore its potential use in quickly removing different types of barrier materials from items in storage will be apparent. Such items vary in size from instruments and bearings to weapons and vehicles.

In the drawings, wherein for the purpose of illustration, is shown one form of the invention, the reference character 1 indicates a flat table top having a supporting angle iron frame 2.

At any convenient place in the table top 2 a screw-threaded opening 3 is formed to receive a similarly screw-threaded nozzle or needle 4. The nozzle 4 has a reduced

and sharpened upper end 5 which protrudes above the table top. A package P having a sealed wrapper W is shown on the table top in position to be opened as will be herein more fully explained.

A plate 6 is countersunk in the table top and provides a smooth contact surface for that part of the package wrapper adjacent the nozzle. The nozzle 4 extends through an opening in the plate 6 and may be adjusted vertically as seen in the drawings, merely by removal of plate 6 and application of a spanner wrench to nozzle 4.

The contents of sealed packages may vary in shape as well as nature and it is desirable that the nozzle be adjustable to avoid damage to the contents. It is also desirable to have the nozzle 4 removable so that it may be replaced by one of different construction. One example of such practice is shown in Figure 4 where the nozzle 4 is reduced in diameter at 5 and pointed as at 7. A bore 8 extends centrally of the nozzle and terminates in multiple branches 9 to quickly distribute compressed air as will be later described.

Figure 5 illustrates an alternate form of nozzle 4' having a reduced diameter 5', a pointed end 7' and a bore 8'. The bore 8' terminates in branches 9', down-turned to prevent clogging by small particles of the wrapper, when the package is rammed down. Other shapes may be used as necessity demands.

Any source of compressed air may be provided, for example a tank 10 may be used to store compressed air.

A pipe 11 conducts compressed air from the tank 10 to a valve casing 12 which is fastened to the underside of the table top 1 in axial alignment with the nozzle 4. Any quick operating valve structure may be used, but the one shown here is illustrative of one form which may be used.

The pipe 11 is screwed into the valve casing 12 in communication with a port 13 in said casing. A sliding valve member 14 has a port 15 normally out of registry with the port 13. The valve member 14 is cup shaped and receives one end of a spring 16 internally against its closed end 17, while the other end of said spring is confined by a stop member 18. The valve is normally held closed by the spring 16. The closed end of valve member 17 is formed with a reduced extension 19 which passes through a hole in the valve casing 12 to contact a lever 20.

The lever 20 is pivotally supported at 21 to a bracket 22 and is connected by a link 23 to a foot treadle 24, which is the means for raising the valve 14 to align the ports 13 and 15.

The operation of the invention is as follows:

Air pressure is kept at a desired degree by any well known pumping mechanism.

When it is desired to use the device the operator has only to press a package down on the table top whereupon the package wrapper is punctured by the nozzle point 7. The treadle 24 is depressed and through link 23 and lever 20 the valve 14 is raised until it reaches the stop member 18. Ports 15 and 13 are now in registry and a blast of compressed air is fed through the nozzle to the interior of the package wrapper.

Internal pressure in the wrapper holds that part of the wrapper adjacent the nozzle snugly against the nozzle and the plate 6 to effect a minimum loss of pressure. The wrapper will now be quickly and completely ruptured so that the contents are left fully exposed.

We have thus provided an opener for sealed packages which is simple, efficient and which, above all, effects a very great savings in time over the cutting or tearing procedure customarily used to open such packages. Using ordinary sized packages containing, for example, anti-friction bearings, it has been found that individual packages can be exploded and the contents removed in a total elapsed time of about 5 seconds per package. The saving in time and expense thus effected where large num-

bers of sealed packages must be opened, is obvious.

While we have disclosed a form of the invention presently preferred by us, various changes and modifications will occur to those skilled in the art after a study of the present disclosure. Hence the disclosure is to be taken in an illustrative rather than a limiting sense; and it is our desire and intention to reserve all modifications falling within the scope of the subjoined claims.

Having now fully disclosed the invention, what we claim and desire to secure by Letters Patent is:

1. In a device for opening wrapped packages by compressed air, a planar support for a package to be opened, said support having an opening therethrough, a plate inlaid in said support flush with the upper surface thereof covering said opening in the support and having a central opening therein, said plate being in contact with the contiguous surface of a package positioned on said support, whereby to prevent escape of compressed air therebetween, a nozzle having a sharp, upwardly projecting point and vertically adjustably fixed with said support and extending upwardly through the opening in said plate beyond the upper surface of said plate and said support to expose its outlet thereabove, a source of compressed air, and a conduit including a manually operable valve between said source and nozzle.

2. In a device for opening wrapped packages by compressed air, a planar support for a package to be opened, said support having a screw threaded opening therethrough, a nozzle having a screw threaded portion engageable in said screw threaded opening for axial adjustment therein and a circumferentially reduced portion normally extending upwardly beyond the upper surface of said support to puncture a package wrapper when the package is forced thereagainst, a removable cover plate positioned at the upper end of said screw threaded opening and having an opening therein to snugly embrace the reduced portion of said nozzle, and means in the screw threaded portion of the nozzle to rotate said nozzle when said cover plate is removed.

3. In a device for opening wrapped packages by compressed air, a planar support for a package to be opened, a sharpened nozzle fixed with said support and extending upwardly through the upper surface thereof with its outlet thereabove, a valve mechanism housing secured to the under side of said support in airtight communication with said nozzle, a valve member in said housing and slidable from a lower closed position to an upper open position, said member having an elongated pin extending downwardly through said housing, a normally expanded spring element in said valve housing and urging said valve member downwardly into closed position, treadle means engageable with said elongated pin to force said slidable valve member to open position against the bias of said spring element, a source of compressed air, and a conduit connecting said source and said valve housing.

4. In a device for opening wrapped packages by compressed air; a planar support for a package to be opened; a nozzle fixed with said support and extending upwardly through the upper surface thereof with its outlet thereabove; a valve mechanism secured to the under side of said support in axial alignment and pressure tight relation with said nozzle, said valve mechanism comprising a housing having an air inlet port and a central opening in its lower end, a hollow cup-shaped valve member slidably fitting said housing and having a port in its side wall registerable with the port in said housing when said member is axially translated from a lower closed position to an upper open position, a stop member in the upper end of said valve housing to limit upward movement of said valve member, a helical spring member within said valve member and urging the same into closed position, an elongated pin integral with the closed end of said valve member and slidable through said central opening in the housing; a source of compressed air; a conduit between said source and valve housing port; and treadle means pivotally connected with said support and engageable with said elongated pin to force said slidable valve member to open position.

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