

May 19, 1970

G. A. SWARTZ

3,512,666

OPENER AND PAD HOLDER FOR PAD-CONTAINING PACKAGE

Filed Aug. 16, 1968

2 Sheets-Sheet 1

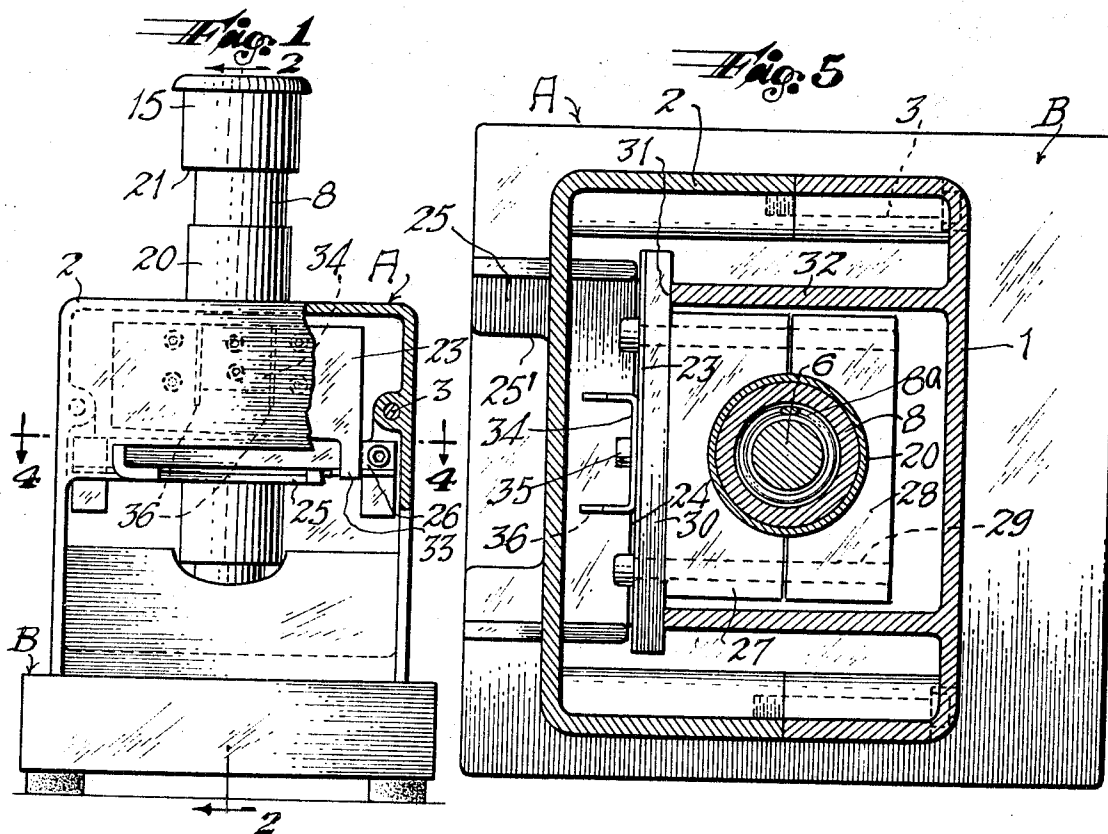
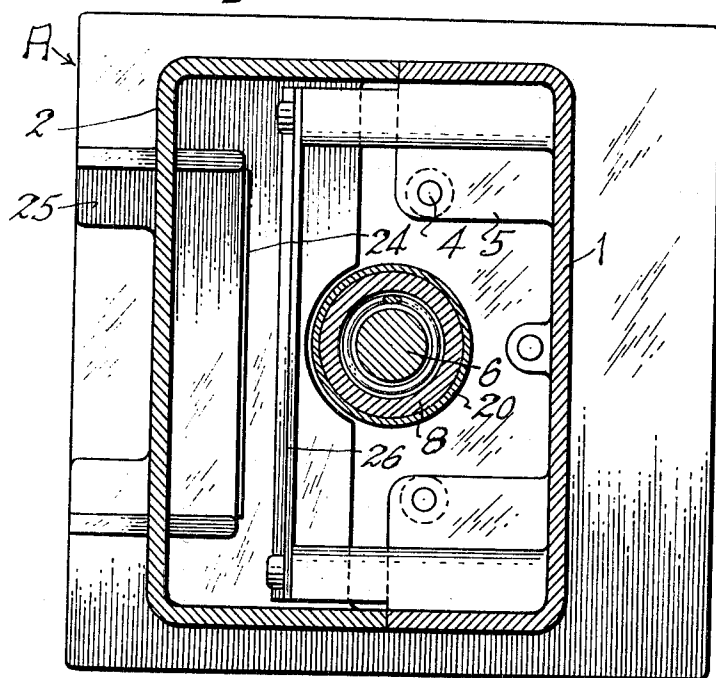
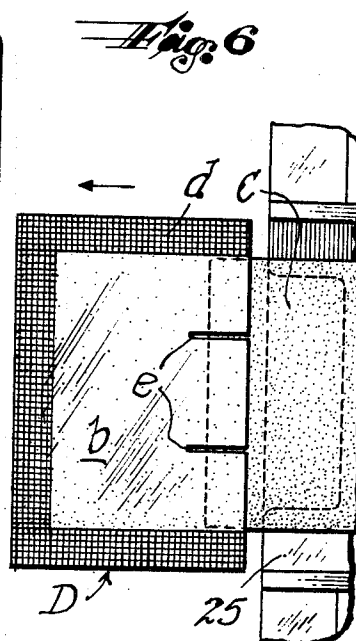


Fig. 4

INVENTOR.
George A. Swartz,
BY
Harry B. Root,
ATTORNEY

May 19, 1970

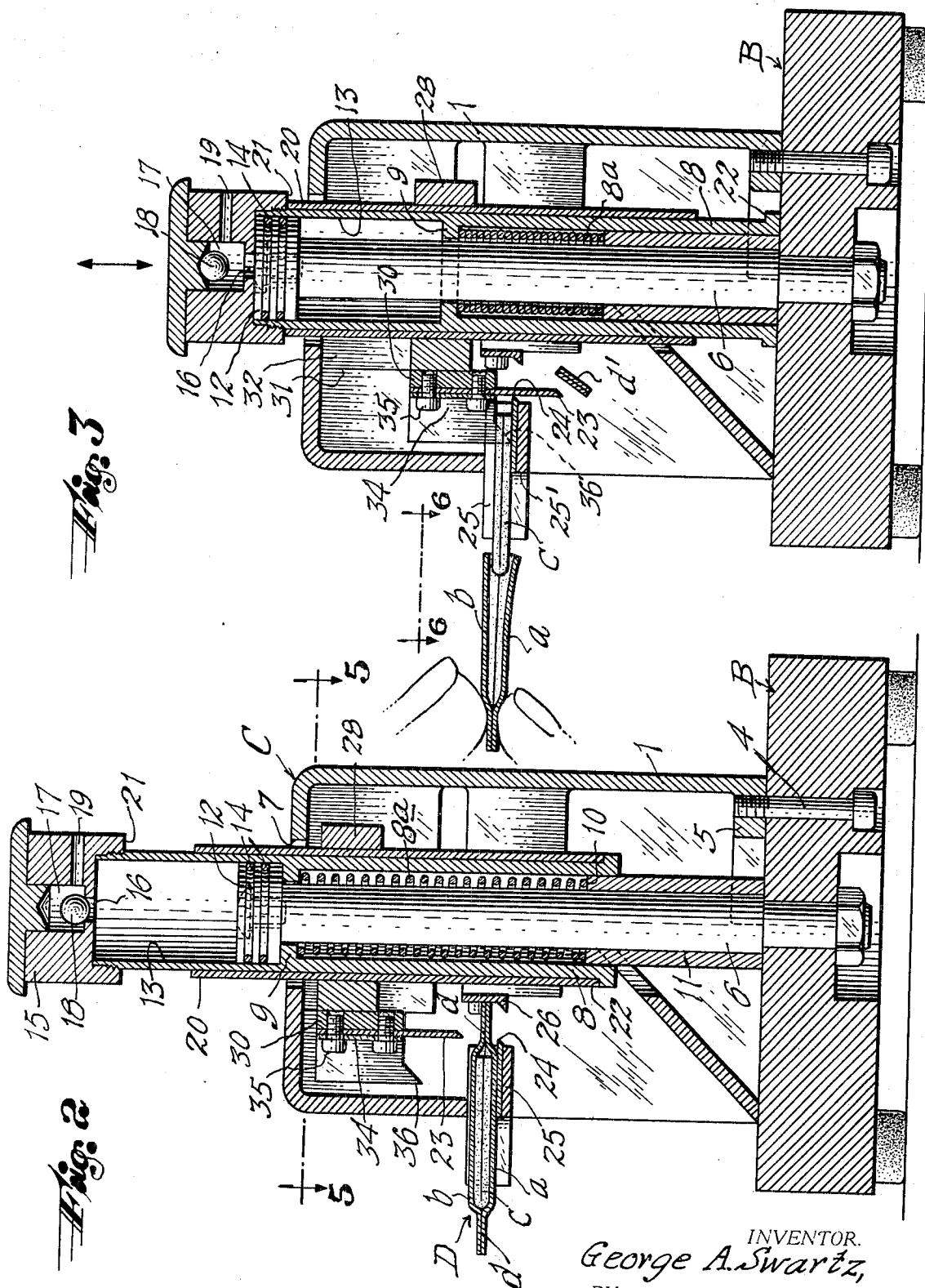
G. A. SWARTZ

3,512,666

OPENER AND PAD HOLDER FOR PAD-CONTAINING PACKAGE

Filed Aug. 16, 1968

2 Sheets-Sheet 2



INVENTOR.
George A. Swartz,
BY
Harry Brook,
ATTORNEY

1

3,512,666

OPENER AND PAD HOLDER FOR PAD-CONTAINING PACKAGE

George A. Swartz, Martinsville, N.J., assignor to Becton,
Dickinson and Company, IL-Metco Division, Newark,
N.J., a corporation of New Jersey

Filed Aug. 16, 1968, Ser. No. 753,116

Int. Cl. B65b 69/00

U.S. Cl. 214—305

4 Claims

ABSTRACT OF THE DISCLOSURE

A device has shelf to support a sealed penetrable pad-containing envelope type package, and there is means including a fixed blade, an actuating plunger, a movable blade and a pad-holder which are movable on and relatively to said plunger to sever a sealed zone from the envelope and penetrate the envelope and the pad upon movement of the plunger in one direction. Movement of the plunger in the opposite direction is retarded to cause the pad holder to hold the pad on said shelf a predetermined time while the envelope is pulled off the pad.

BACKGROUND OF THE INVENTION

Field of the invention

The invention relates particularly to cutting devices having plunger-operated reciprocating blades for opening sealed envelope-type packages.

The prior art

Envelope-type packages having pads or swabs sealed therein are well known and frequently used in hospitals, but difficulty has been encountered in opening the envelopes and removing the pads. For example, a nurse needing a swab for use prior to making a hypodermic injection has been required to use both hands to cut open the envelope and remove the pad, and this has necessitated the momentarily laying down of the hypodermic needle with consequent danger of contamination while opening the package, followed in many instances by the shifting of the pad from one hand to the other.

The present invention is directed to the provision of means to enable successively the package to be opened and the envelope to be pulled from the pad by use of one and the same hand, leaving the other hand free, for example, to hold a hypodermic needle.

SUMMARY

A primary object of the invention is to provide a device by which a pad-containing sealed envelope-type package can be opened in readiness for manual removal of the pad, and the pad can be held on a support while the envelope is being stripped off the pad.

The invention also contemplates a support or shelf for the package and means to sever a portion of the envelope and to penetrate the envelope and the pad in one continuous operation so that the pad can be held against movement on said support and the envelope can be pulled off the pad while the pad is so held.

The invention also provides means whereby the severing of the envelope and the holding of the pad can be effected by one hand and the pad is held for a predetermined time sufficient to permit use of the same hand to pull the envelope off the pad.

A BRIEF DESCRIPTION OF THE DRAWINGS

For a complete understanding of the invention, reference is to be had to the following description in conjunction with the accompanying drawings in which:

2

FIG. 1 is a front elevation of a device embodying the invention, with portions broken away for clearness of illustration;

FIG. 2 is an enlarged central vertical sectional view approximately on the plane of the line 2—2 of FIG. 1 and showing a package in position to be opened;

FIG. 3 is a similar view showing the package opened, the pad being held on the supporting shelf and the envelope being pulled off the pad;

FIG. 4 is an enlarged horizontal sectional view on the plane of the line 4—4 of FIG. 1;

FIG. 5 is a similar view on the plane of the line 5—5 of FIG. 2, and

FIG. 6 is a fragmentary horizontal sectional view on the plane of the line 6—6 of FIG. 3.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Specifically describing the illustrated embodiment of the invention, the device includes a frame A which is shown as comprising a base block B and a housing C which is shown as including two sections 1 and 2 separably secured together by cap screws 3 and removably secured on the base block B by cap screws 4 passing through openings in the block and screwed into flanges 5 on the housing section 1.

Rigidly mounted on the base block B is a vertical post 6 which extends upwardly in the housing and through an opening 7 in the top wall of the housing. Reciprocably slidable on the post is an actuating plunger 8 which is normally biased in one direction or upwardly by a compression spring 8a which is interposed between an inwardly extending flange 9 on the plunger and a shoulder 10 on the post which is shown as provided by a short bearing sleeve 11 on the post on which one end of the tubular plunger 8 is slidable. The flange 9 also forms a bearing for the plunger on the post and coacts with a head 12 on the post for limiting movement of the plunger under the influence of the spring 8a.

The head 12 is shown as a piston in a cylinder 13 provided in the upper end portion of the plunger, and packing rings such as O-rings 14 are seated in the piston to slidably engage the wall of the cylinder 13. The upper end of the plunger 8 has an operating knob 15 which closes the end of the cylinder opposite the piston and has a port 16 communicating with the chamber 17 of a ball check valve 18, and passage 19 establishes communication between the valve chamber 17 and the atmosphere. The check valve permits outflow of air from the cylinder and prevents inflow of air into the cylinder as the plunger moves from its normal position shown in FIG. 2 and returns to said normal position, respectively.

A sleeve 20 is freely slidably mounted on the plunger 8 between two shoulders that are spaced apart longitudinally of the plunger, one of said shoulders constituting the inner end 21 of the operating knob 15 and the other shoulder 22 being formed by an exterior flange at the end of the plunger opposite the knob 15.

The sleeve 20 carries a movable blade 23 which coacts with a fixed blade 24 mounted on the machine frame. Preferably as shown, the blade 24 is secured to and forms a portion of the top surface of a support or shelf 25 which is preferably cast integrally with the housing section 2 for supporting a package D to be opened. As shown, the package D comprises an envelope formed of two layers a and b of suitable penetrable packaging material such as metal foil or a synthetic plastic material such as "Pliofilm." A pad or swab c, for example a sheet of flannel impregnated with a liquid is enclosed between the layers a and b which have their edge portions sealed together in bounding relation to the pad as indicated at

3

d, thereby forming an envelope type pad-containing package.

The shelf 25 and fixed blade 24 are so located with respect to the movable blade 23 that the package may be set on the shelf with one sealed edge portion abutting a stop bar 26 which locates the package with the inner margin of the sealed portion *d* between the edges of the two blades 23 and 24 as best shown in FIG. 2.

The movable blade 23 is shown as mounted on the sleeve 20 by means of two complementary blocks 27 and 28 which are secured in snugly embracing relation to the sleeve by cap screws 29 which also secure a guide plate 30 to the block 27 and at the same time fasten the movable blade on said guide block. The guide plate slidably engages guide surfaces 31 formed on the edges of webs 32 which project inwardly of the housing on section 1. The plate 31 is thus guided for accurate reciprocation in a vertical plane, and to ensure proper coaction of the edge of the movable blade with the fixed blade, the movable blade is shown with a finger 33 which slidably engages the inner edge of the shelf adjacent the edge of the fixed blade 24.

Also mounted to move with the sleeve 20 is a pad holder 34 which is shown as comprising a channel shaped piece of metal secured to the bar 30 by screws 35. The flanges of the pad holder have package penetrating points 36 at their lower edges which during operation of the device are caused to penetrate the envelope and the pad simultaneously with or immediately after the movable blade coacts with the fixed blade to sever the envelope.

In operation of the device, the package to be opened is placed on the shelf 25 as shown in FIG. 2 and the plunger and sleeve as well as the movable blade and the pad holder are held by the spring 8*a* in their normal upper positions. With one hand, the operator will push downwardly on the knob 15 to cause the plunger to move downwardly, and the sleeve, the blade 23 and the pad holder will descend at the same time, with the sleeve resting on the shoulder 22 of the plunger. The movable blade will contact the edge portion of the package and the movement of the blade, pad holder and sleeve will be momentarily arrested and movement of the plunger will continue until the shoulder 21 of the plunger abuts the upper end of the sleeve 20, whereupon the blade will be forced downwardly to sever the edge portion *d'* of the envelope (FIG. 3) and the points of the pad holder will be forced downwardly so as to penetrate the envelope and the pad as shown in FIG. 3. During this downward movement of the plunger, the air in the cylinder will be forced out through the port 16 past the check valve 18 and into the atmosphere through the passage 19. The downward movement of the plunger is arrested, either by engagement of the knob with the piston or by engagement of the lower end of the plunger with the base plate B. The operator then releases the knob 15 and the plunger is slowly returned by the spring 9 to its normal position. The return of the plunger will be retarded because the check valve 18 is closed and air passes the piston slowly from the portion of the cylinder below the piston to the portion of the cylinder above the piston. During this retarded movement, the operator may grasp the envelope with the same hand and pull the envelope off the pad as shown in FIG. 3, the points 36 of the pad holder cutting through the envelope as indicated by the slits *e* in FIG. 6. As the plunger continues its return movement, the shoulder 22 engages the sleeve 20 to lift the pad holder points 36 out of the pad whereupon the operator may lift the pad from the shelf for such use as desired. Preferably the shelf is cut away at 25' to provide a clearance for the fingers of the operator. Return movement of the plunger is stopped by abutment of the flange 9 with the piston as shown in FIG. 2 so that the movable blade and the pad holder are properly located in their normal positions in readiness for operation upon the next package. Should it be desired to adjust the position of the pad holder points,

4

the blocks 27 and 28 can be slid upwardly or downwardly on the sleeve by simply loosening and subsequently tightening the screws 29.

From the foregoing it will be seen that the invention provides a simple device which permits, for example, a nurse in a hospital clinic to manipulate the device, open the package and pull the envelope from the pad and lift the pad from the shelf, all with one hand, while holding, for example, a hypodermic needle in the other hand.

While the now preferred embodiment of the invention has been disclosed, it should be understood that this is for the purpose of illustrating the principles of the invention and that modifications and changes can be made in the construction of the device without departing from the spirit of the invention.

I claim:

1. A device for opening a sealed pad containing penetrable envelope type package and momentarily holding the pad while the envelope is removed during removal of the envelope, said device comprising a frame having a shelf and means associated with the shelf for supporting a package in a predetermined position with a sealed edge portion projecting beyond the shelf, a fixed blade on the frame below said shelf, a movable blade mounted on the frame and coactive with said fixed blade upon movement from a normal position in one direction to sever said sealed portion and open the package, a pad holder movable with said movable blade to penetrate said package and hold said pad on the shelf upon movement of said blade in said direction and to release said pad upon return movement of said movable blade in the opposite direction, and means to retard said return movement of said movable blade to cause said pad holder to hold the pad on said shelf a predetermined time.

2. A device as defined in claim 1 wherein said movable blade and said pad holder are rigidly mounted on a sleeve and there are:

a plunger on which said sleeve is freely slidably mounted for movement from a normal position to a pad holding position and vice-versa by and between shoulders spaced apart longitudinally of the plunger, a post on said frame on which said plunger is reciprocally mounted,

means biasing said plunger in the direction to return said sleeve and movable blade to their normal positions, and

means for retarding said return movement of the plunger whereby movement of said pad holder from said pad holding position is delayed.

3. A device as defined in claim 2 wherein the last-named means includes a piston and a cylinder therefor one of which is located in said plunger and the other of which is disposed in said piston,

said cylinder has a passage communicating with the atmosphere, and

a check valve permits outflow of air from said cylinder and prevents inflow of air into said cylinder as the plunger moves from said normal position and returns to said normal position, respectively.

4. A device for opening a sealed pad-containing penetrable envelope type package and momentarily holding the pad during removal of the envelope, said device comprising a frame having a support for the package, means including a reciprocable plunger movable on the frame in one direction to sever a sealed edge portion from the envelope of the package on said shelf and immediately thereafter penetrate the envelope and the pad and hold the pad on the shelf as the envelope is pulled off the pad, said means upon movement of the plunger in the opposite direction releasing said pad for removal from the shelf, said means also including a fixed blade on the frame, a sleeve loosely slidable on said plunger between two shoulders on the plunger, a movable blade carried by said sleeve coactive with said fixed blade, and a pad

5

holder also carried by said sleeve and coactive with said shalf to penetrate and hold the pad, whereby upon movement of the plunger in one direction one shoulder will abut said sleeve to move the sleeve with said blade and said pad holder so as to sever the envelope and penetrate and hold the pad, respectively, and thereafter provide for continued movement of the plunger in said direction independently of the sleeve, and with the addition of means to bias the plunger in the opposite direction and cause the other shoulder on the plunger to abut the sleeve and thereafter raise the sleeve and pad holder to release the pad, and means for retarding movement of the

6

plunger in the second-mentioned direction to allow the pad holder to hold said pad a predetermined time.

References Cited

UNITED STATES PATENTS

1,487,130	3/1924	Witherell	-----	214—305	X
2,645,007	7/1953	Alfredsson et al.	--	206—41.5	X

HUGO O. SCHULZ, Primary Examiner

U.S. Cl. X.R.

30—2