May 9, 1950 M. R. FIELDS 2,507,097

AMPOULE OPENER

Filed Oct. 15, 1945

Fig. 1

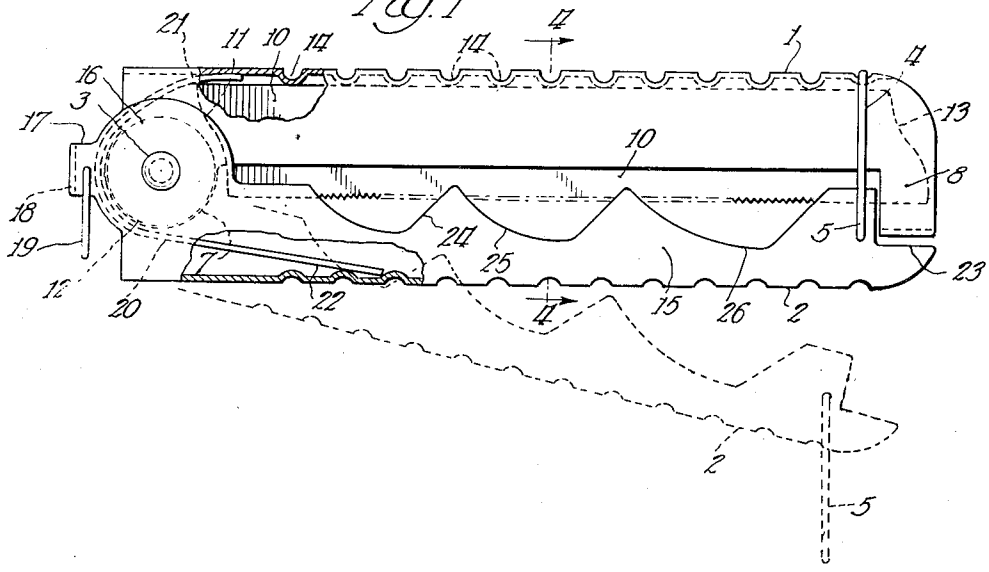


Fig. 4.

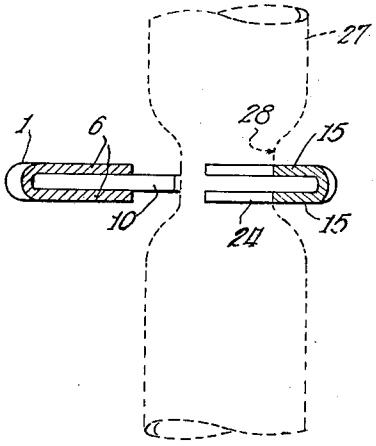


Fig. 2

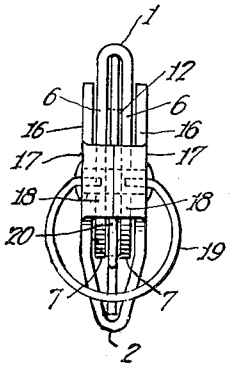
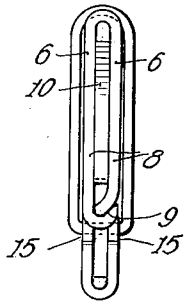


Fig. 3.



Inventor
Mack R. Fields.
By Soans, Pond & Anderson
Attys.

Patented May 9, 1950

2,507,097

UNITED STATES PATENT OFFICE

2,507,097

AMPOULE OPENER

Mack R. Fields, Chicago, Ill., assignor to Abbott Laboratories, North Chicago, Ill., a corporation of Illinois

Application October 15, 1945, Serial No. 622,347

4 Claims. (Cl. 49—52)

1

This invention relates to a device for opening ampoules; that is to say, sealed glass vials containing medicaments or other materials which are maintained in a sterile condition, or otherwise preserved by being enclosed in a hermetically sealed container.

Ampoules of this character are employed largely by the medical profession and they are supplied to physicians and surgeons in hermetically sealed condition containing various medicaments. The doctor usually open the ampoule by drawing a file across the neck portion and then breaking the ampoule at the neck. The file mark serves to facilitate the breaking at the selected point.

The opening of an ampoule in the customary manner as described is attended with considerable inconvenience in that a suitable file must be at hand. In order that such a file will always be immediately available, it has been the practice to package a file with each ampoule. The furnishing of a file in this manner necessarily increases the cost of the product and the packaged weight thereof, which is further reflected in the cost due to the increased shipping charge.

Even when the file is conveniently available, its use for the purpose indicated has been a matter of inconvenience and difficulty. Necessarily, the file must be drawn across the ampoule while applying considerable pressure on the file to cause it to scratch the surface of the glass. This is difficult because of the small size of the file which is usually furnished, and the attendant lack of a large enough mass to afford a firm grip. There are other objections to the conventional method of opening ampoules but those mentioned typify the general situation.

The objects of the present invention are to eliminate the necessity for supplying a separate file with each ampoule while at the same time providing ampoule opening means which may easily be maintained available for use at all times; to provide an ampoule opening device which will facilitate the application of adequate pressure for opening the ampoule; and in general, it is the object of the invention to provide an improved means for opening ampoules of the character indicated.

Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawing, wherein there is illustrated an ampoule opening device embodying a selected form of the invention.

In the drawing:

Fig. 1 is a side elevation in which certain portions have been broken away and shown in sections to more fully illustrate some details of construction;

2

Figs. 2 and 3 are end elevations of the left-hand and right hand ends respectively of the device as shown in Fig. 1, and

Fig. 4 is a section on the line 4—4 of Fig. 1 but showing the parts in a slightly changed position.

The ampoule opening device illustrated in the drawings comprises two sections, respectively designated 1 and 2, which are pivoted together at one end as indicated at 3, and provided at the other end with a loop 4, which is pivoted as indicated at 5 in the member 2, and adapted to be swung over the adjacent end portion of the member 1 to hold the two sections in the closed position illustrated in Fig. 1.

Both members 1 and 2 are made of sheet metal strips bent into U-shaped form in cross section. The member 1 includes the spaced leg or wall portions 6—6 and ears 7—7 at one end for forming a part of the pivot connection with the member 2. The other end of the member 1, i. e., its free end, is provided with leg extensions or ears 8—8 which have their ends overlapped and pressed tightly together as indicated at 9. The overlapping ends may be soldered or otherwise secured together at 9, if desired, although this is not necessary.

A file 10 is seated in the member 1 between its sides 6—6, one end 11 of the file abutting a washer or other suitable filler 12 located between the pivot ears 6—6 of the member 1. The other end 13 of the file is housed within the free end portions of the sides 6—6 of the member 1 and the free end ears or extensions 8—8 thereof. The sides 6—6 of the member 1 are so spaced that the file 10 will fit fairly snugly therebetween while at the same time being movable into or out of the member 1 by endwise movement through the free end loop formed by the walls 6—6 and ears 8—8.

In one form of the device, the file rests on the inside surface of indentations 14 formed in the bottom of the member 1 as clearly shown in Fig. 1. In addition to providing supports for the file, the indentations 14 serve the important function of facilitating gripping of the device as will presently appear. In some instances, a fill of lead or solder may be provided in the bottom of the channel-shaped member 1 for supporting the file in the desired position within the member 1.

The member 2 comprises side walls 15—15 disposed generally parallel with and in co-planar relation to the walls 6—6 of the member 1. At

one end, the member 2 is equipped with ears 16—16 which are offset outwardly from the planes of the walls 15—15 so as to be capable of embracing the ears 7—7 of the member 1 as clearly shown in Figs. 1 and 2. To maintain the ears 16—16 properly spaced, they may be equipped with extensions 17—17 and inturned ears or legs 18—18 which are adapted to abut each other as shown in Fig. 2 to thereby maintain the said spacing of the pivot ears 16—16.

A suitable bail or ring 19 may be secured in the extensions 17 and the device may conveniently be attached to a key chain or the like through the agency of said bale.

A spring 20 having a portion looped around the pivot pin 3 or around the washer 12 and legs 21 and 22 respectively engaging the bottoms of the members 1 and 2, is provided for yieldingly urging the members 1 and 2 to swing on the pivot 3 to an open position. The loop 4 previously referred to serves to hold the members in closed position as illustrated in Fig. 1 against the opening force of the spring 20.

The normal width of the walls 15—15 is approximately the same as that of the walls 6—6 and at the free end of the member 2 they are recessed as shown at 23 to receive the extensions 8 of the walls of the member 1. Said walls 15—15 are also provided with recesses or notches 24, 25 and 26 of progressively increased or decreased size as shown. These recesses 24, 25 and 26 are of more or less V-shape so as to be adapted to position an ampoule in substantially fixed relationship to the member 2 while the member 1 is pressed toward the member 2 so as to hold the file 10 against the ampoule.

The device is used by first disengaging the loop 4 from the member 1 so as to permit the spring 20 to open the members 1 and 2 relative to each other. An ampoule is then positioned in one of the notches or recesses 24, 25 and 26, depending upon the size of the ampoule, and the member 1 is then manually urged towards the member 2 so as to cause the file to bear against the ampoule positioned in the member 2. The ampoule is then rotated which causes a circumferential portion thereof to be moved across the teeth of the file 10 thereby providing a continuous scratch in the surface of the ampoule completely around the same. It is not necessary to scratch the ampoule surface all the way around but it is a simple matter to do so with the described device, and opening of the ampoule by breaking the same at the scratch line is adequately controlled so that a desirable smooth and even break will result.

In Fig. 4 an ampoule is represented in dotted lines at 27, a neck portion 28 thereof being shown seated in one of the notches such as the notch 24.

Files for opening ampoules are generally available in the form illustrated; that is to say, with their ends cut or broken in the diagonally extending, more or less ogee curved form shown. Such a file is insertable into the member 1 by being moved endwise through the free end guard loop formed by the joined extensions 8—8, the file being slid between the sides 6—6 of the member until the innermost end of the file abuts the washer 12 at the pivot end of the device. When the file is properly inserted, the outer end of the file will be located wholly within the guard loop at the free end of the member 1 as shown. If the file is inserted with the wrong end first, the outer end portion of the file will be caused to project beyond the end of the member 1 so that

the improper positioning of the file will be immediately apparent. It may then be withdrawn and turned end for end and inserted in a proper manner. The arrangement described thus insures positioning of the file with the cutting teeth thereof facing in a predetermined direction. Cutting of the surface of the ampoule will, therefore, be most advantageously effected when the ampoule is rotated in a given direction.

The angle at which the ends of the file are formed and the direction of the cutting teeth is such that when the ampoule is rotated to secure the most efficient cutting effect from the file, there will be a strong tendency to move the file endwise toward the pivot washer 12. Hence, each time the device is used there will be a force exerted to move the file to its fully seated position in the member 1. It is not, however, necessary to provide any special means for locking the file in its seated position since the fit of the file between the sides 6—6 of the member 1 is sufficiently snug to resist accidental displacement of the file. Such frictional holding effect is somewhat augmented by the fact that the files which are commercially available, are usually slightly bowed in their length so that they provide their own spring holding action against the sides of the member 1. Files such as are supplied for the purpose indicated are of such quality that a considerable number of ampoules may be cut with each file before it is dulled to such an extent that it must be replaced. When replacement is necessary, it is accomplished by opening the device and forcing the file endwise out of the member 1. This is readily effected by gripping the member 1 containing the file between the thumb and the index finger with the thumb engaging and urging the file to move endwise out of the holder 1.

Various changes in the details of construction of the described device may be made without departing from the spirit of the invention.

I claim:

1. A device for opening ampoules and the like, comprising a pair of elongated, pivotally interconnected members, one of said members being provided with a file projecting from one of the long edges of the member, and the other of said members being U-shaped transversely and provided with means for positioning an ampoule or the like in fixed relationship to said member and in cutting relationship to said file, said U-shaped member being so positioned relative to the other member as to permit said projecting file to enter between the legs of the U-shaped member for closing the device.

2. A device for opening ampoules, comprising a pair of elongated, pivotally interconnected members, one of said members being provided with file projecting from one of the longitudinal edges of the member and the other of said members being U-shaped transversely, the legs of said U-shaped member being respectively disposed on opposite sides of the plane of said projecting file and having their edges, which are adjacent to said file bearing member, provided with recesses for positioning an ampoule in cutting relationship to said file, said recessed edges providing supports for the ampoule on opposite sides of the plane of the file so as to thereby support the ampoule against rocking about the edge of the file incident to manipulation of the ampoule during opening thereof.

3. An ampoule opening device, comprising a

pair of pivotally interconnected, elongated members adapted to be moved relative to each other about the pivot connecting said members so as to enable their respective inner edges to be moved toward each other, one of said members having its inner edge provided with an elongated recess, which is adapted to have a file slidably seated therein with the cutting edge portion of the file projecting from the recessed edge of the member, the other of said pivoted members having its inner edge portion provided with a notch having a wall portion which is remote from said pivot at an abrupt angle to the length of said member and a wall portion which is adjacent to said pivot at a lesser angle to said length of said member, said abrupt edge portion serving during the operation of cutting an ampoule to more effectively resist displacement of the ampoule lengthwise of the inner edges of said members incident to reaction forces resulting from cutting engagement of the ampoule with a file seated in said recessed edge member as aforesaid, the pivoted end portion of the device being provided with an element adapted to be engaged by the file to limit endwise sliding movement thereof in said recess incident to forces applied to said file in the ampoule cutting operation.

4. An ampoule opening device, comprising a pair of pivotally interconnected, elongated members adapted to be moved relative to each other about the pivot connecting said members so as to enable their respectively adjacent inner edges to be moved toward each other, one of said members having its inner edge provided with an elongated recess, a file longitudinally slidably seated in said recess with the cutting edge portion of the file projecting from the recessed edge of the member, and the back edge of the file disposed adjacent the bottom of the recess in the member, the other of said pivoted members having its inner edge portion provided with a notch for receiving and positioning an ampoule against movement lengthwise of the device and for cutting engagement with said file, abutment means at the pivoted end portion of the device engageable by the adjacent end of said file to limit endwise sliding movement thereof in said recess incident to forces applied to said file when an ampoule is rotated in said notch in cutting engagement with said file, said file having substantially parallel ends inclined relative to the cutting edge of the file, the angularity of said ends being such that when the file is properly placed in said recessed member, the end portion of the file at the back edge thereof will extend lengthwise of the device over a portion of said abutment means.

MACK R. FIELDS.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
849,149	Lybeck	Apr. 2, 1907
870,951	Goodholm et al.	Nov. 12, 1907
1,169,600	Bastian	Jan. 25, 1916
2,410,901	Ramsey	Nov. 12, 1946