

⑩



Europäisches Patentamt
European Patent Office
Office européen des brevets

⑪ Publication number:

**0 070 720
B1**

⑫

EUROPEAN PATENT SPECIFICATION

⑬ Date of publication of patent specification: **15.10.86**

⑭ Int. Cl.⁴: **A 61 J 3/10**

⑮ Application number: **82303769.2**

⑯ Date of filing: **19.07.82**

⑰ **Convex tablet, a sealed package containing the same, and the production of such a tablet.**

⑱ Priority: **20.07.81 US 285212**

⑲ Date of publication of application:
26.01.83 Bulletin 83/04

⑳ Publication of the grant of the patent:
15.10.86 Bulletin 86/42

㉑ Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

㉒ References cited:
**WO-A-82/01818
BE-A- 779 427
GB-A-2 048 158**

**HAGERS HANDBUCH DER
PHARMAZEUTISCHEN PRAXIS, vol. 7, 1971,
pages 690,691, Springer Verlag, New York,
USA**

㉓ Proprietor: **WARNER-LAMBERT COMPANY**
201 Tabor Road
Morris Plains New Jersey 07950 (US)

㉔ Inventor: **Eoga, Anthony B.J.**
321 Rexland Drive
Boonton New Jersey 07005 (US)

㉕ Representative: **Jones, Michael Raymond et al**
HASELTINE LAKE & CO. Hazlitt House 28
Southampton Buildings Chancery Lane
London WC2A 1AT (GB)

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European patent convention).

Courier Press, Leamington Spa, England.

EP 0070 720 B1

Description

This invention relates to convex tablets, to the production of such tablets, and to packages in which tablets are sealed in pouches defined by opposed sheets of material.

Most tablets, whether for medicinal purposes or otherwise, are manufactured with essentially the same basic shape of essentially flat broad surfaces. In many instances, such as when the tablets contain some active chemical agent, they are desirably vacuum sealed within sheet-like packaging in sandwich relationship, in such manner that the sheets converge to form a pouch about the tablet defining a perimeter generally corresponding to a circle.

Conventional tablet shape is defined in cross-section by essentially flat, parallel broad surfaces, sometimes defining at the circumferential periphery a slight bevel, provided primarily to minimize tablet edge fracture.

The high cost of raw materials, including packaging materials, has prompted consideration of ways to reduce incidental costs to keep down the ultimate cost of the packaged tablet product. Consideration has therefore recently been given to a reduction in the packaging material requirements for tablets, and a review of the prior art packaged tablet discloses a substantial amount of unused space in the package pouch.

In particular, the unused space, which corresponds to wastage, is most apparent when the tablet is relatively thick, the latter to ensure sufficient tablet strength during manufacture and transportation. Also, in the instance where the tablet is relatively thick and is packaged by sealing within pouches formed by parallel sheet materials, the conventional cylindrical tablet configuration has been found to exert a strain on the package that causes the seals between the package sheets to rupture, with the result that product shelf life may be reduced and spoilage may occur.

Another problem that has existed concerns the packaging of the tablets. Generally, tablet packaging is performed by the adhesive bonding of parallel sheets of packaging material, with non-bonded areas defined periodically on the sheets to provide pouches to retain the tablets. The tablets are usually conveyed while resting on their broad surfaces, and reach a chute, where the tablets drop vertically downward and are then conveyed between the package sheets as they are brought together to seal off the pouch area.

During the foregoing procedure, the tablets occasionally tend to stack or ride upon each other in the course of the vertical drop into position between the package sheets. This occurrence, known as "shimming", is undesirable and can cause jamming of the packaging machinery, so that the machinery must be shut down to remove the extra tablets from the pouch. Naturally, such difficulties are time consuming and add to manufacturing expense.

BE—A—779427 discloses tablets having two

broad outer surfaces which are generally opposed to each other and are spaced apart from each other by a continuous rim. Each of the two broad outer surfaces disclosed in BE—A—779427 is a smooth convex shape, resembling a portion of a sphere.

Hagers Handbuch der Pharmazeutischen Praxis, Springer-Verlag, 1971 discloses a variety of tablets, some of which are like those disclosed in BE—A—779427 referred to above. Other types of tablets disclosed in Hagers Handbuch have two opposed, spaced-apart outer surfaces each of which has a convex peripheral region and a flat central region.

There is therefore a need to reduce or eliminate the difficulties recognized in the prior art, by providing a tablet that reduces packaging costs, by reducing both the size and thickness of the packaging materials, as well as a reduction in the incidence of package failure. Also, it would be desirable to prepare a tablet that reduces or eliminates the occurrence of "shimming" during packaging.

According to one aspect of the present invention, there is provided a tablet (10) comprising: two broad outer surfaces (12) which are generally opposed to each other, are generally spaced apart from each other, and terminate in spaced-apart surface perimeters (14); and a continuous rim (16) extending transversely between the surface perimeters (14); wherein at least one of the broad outer surfaces (12) is distended convexly away from the other: characterised in that at least one broad outer surface, over at least a majority of vertical planes passing through the centre of the tablet (10) when the latter is disposed with the rim (16) generally vertical, either (a) consists of a central convex region (18) and a peripheral convex region (20) adjacent thereto, the external angle (α) between the central convex (18) region and the peripheral convex region (20) being greater than 180° , or (b) comprises a central region, a peripheral convex region (20') and, between the central and peripheral regions, an intermediate convex region (18''), the external angle between the peripheral convex region (20'') and the intermediate convex region (18'') being greater than 180° and the external angle between the intermediate convex (18'') region and the central region also being greater than 180° .

The reference numerals appearing against certain components in the immediately preceding paragraph are those of the corresponding components indicated in Figures 1 and 2 or Figure 10 of the accompanying drawings, and are provided by way of illustration only, without limitative effect.

Preferably in a tablet in accordance with the present invention, having an improved configuration for more economical sealable packaging and reduced spoilage, both of the broad outer surfaces are distended convexly away from each other thereby defining a tablet having a generally bi-convex configuration. Preferably the broad surfaces are symmetrically distended.

Preferably the continuous rim defines a cylindrical surface which is circular or non-circular.

A continuous ridge is preferably defined on the exterior of the or each broad outer surface at the junction of the central or intermediate convex region and peripheral convex region; it is the peripheral convex region which defines the tablet point bend, i.e. the point at which the walls of the pouch containing the tablet are drawn towards adhesive contact with each other. Preferably, the surfaces of the peripheral convex regions of the opposed broad outer surfaces subtend between them an acute angle, which more preferably is less than 45°.

The invention also relates to a sealably packaged tablet which comprises, in combination, a tablet package prepared from opposed package sheets peripherally adhered to each other and defining an air-tight tablet pouch containing a tablet of the present invention as described above. The present packaged tablet utilizes a pouch that can be reduced in size compared with many of those of the prior art while retaining the capability for holding a tablet having equivalent weight and content to those of the prior art. The package may include a plurality of spaced apart pouches each containing a tablet.

The present invention also includes a method of preparing a tablet according to the first-mentioned aspect of the present invention, which method comprises providing a tablet die having a configuration complementary to that of the tablet according to the present invention which is to be produced, loading the tablet die with tablet-forming material, and compressing the tablet-forming material within a tablet die form a tablet having the desired configuration. Preferably, both broad surfaces of the die are concave, and thus a tablet having bi-convex configuration is formed. Further, the die may be configured to correspond in shape to the preferred tablet configurations set forth above.

Tablets prepared in accordance with the present invention permit packaging material to be reduced in amount by as much as 20 to 25% in area, while package sheet thickness may be reduced as much as 30%. Also, tablets of the present configuration resist breakage and spalling during manufacture and shipping, and the packaging machinery jamming is reduced due to a corresponding reduction in the incidence of "shimming".

The present invention is applicable to tablets for a variety of uses extending from medicinal compounds to household goods. The exact angulation and size of individual tablets will be governed by the materials being formed, although the basic convex configuration is utilized in each instance.

For a better understanding of the present invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:—

Figure 1 is a perspective view of one embodi-

ment of tablet in accordance with the present invention;

Figure 2 is a side view illustrating the tablet of Figure 1;

Figure 3A is a vertical section through a known tablet enclosed in a sealed package;

Figure 3B is a vertical section through a tablet similar to that of Figure 1, enclosed in a sealed package;

Figure 4A is a plan view, partly in phantom, illustrating the packaged, known tablet shown in Figure 3A;

Figure 4B is a plan view, partly in phantom, illustrating the packaged tablet of Figure 3B;

Figure 5 is a side view illustrating a tablet in accordance with the present invention, similar to that shown in Figure 1;

Figures 6 and 7 are vertical sections through further known tablets, the tablet of Figure 7 being shown sealed within a package; and

Figures 8, 9 and 10 are perspective views of yet further embodiments of tablets in accordance with the present invention.

Referring to the drawings, wherein like numerals designate like parts, and referring first to Figures 1 and 2, a tablet 10 comprises paired broad outer surfaces 12 that extend radially outward generally opposed to each other, and terminate in parallel spaced-apart surface perimeters 14. A continuous rim 16 extends transversely between surface perimeters 14 as shown, and may preferably define a circular cylinder as shown in Figures 1 and 2.

As shown in Figures 1 and 2, both broad surfaces 12 may be convexly extended; however, the invention includes the instance where only one broad surface 12 is convex.

The broad surfaces 12, when convexly extended as shown, comprise a central convex region 18 and a peripheral convex region 20 that is located annularly adjacent to it.

The convex regions 18 and 20, as shown in Figures 1 and 2, define exterior surfaces that are disposed at an external angle with respect to each other that is greater than 180°. In particular, and with reference to Figure 2, an angle α is shown that is defined by the exterior surfaces of convex regions 18 and 20.

In some embodiments of the present invention, the convex region 20 may define a bevelled surface that conforms to the frustum of a cone, in the instance where the tablet 10 is circular in shape. Similarly, the convex region 18, while graduated at a differing angle of inclination than that of the region 20, may define in one embodiment an essentially conical configuration. The shape of respective convex regions 18 and 20 may accordingly vary, and, for example, as illustrated in Figure 8, convex region 18' may define a shape that is essentially pyramidal, in combination with the essentially frustoconical shape of region 20'. The invention contemplates a variety of shape combinations within its scope, and should not be limited to specific combinations illustrated herein.

Referring further to Figures 1 and 2, where the

convex regions 18 and 20 differ in slope as shown, they define at their junction a continuous ridge 22 which, in the illustrations herein, may comprise a circle, as in Figure 1. Naturally, the specific shape of ridge 22 will depend upon the shape of the tablet 10, and the present invention includes ridges having oval, square, rectangular, and other shapes within its scope.

One of the important features of the present invention relates to the configuration of the peripheral convex region 20. In particular, and with reference to Figures 2 and 3B, one of the advantages of the present configuration is that it reduces the strain on the packaging material in the instance where the tablet is sealably packaged within two originally parallel package sheets, and permits reductions in both packaging sheet gauge and size, as will be more particularly explained.

Referring to Figure 3B, a packaged tablet is shown which comprises a tablet 10 disposed within a package 24 consisting of paired, opposed packaged sheets 26 that have been peripherally bonded to each other, and, in their non-bonded area, define a package pouch 28 to hold the tablet. Correspondingly, Figure 3A illustrates a packaged tablet in accordance with the prior art, and tablet 30 illustrated therein is thus enclosed within a tablet package 32 prepared from paired sheets 34 likewise peripherally bonded to define a central package pouch 36.

The differences between the novel and known packages include certain visual distinctions that are readily apparent. For example, tablet 30 utilizes essentially flat broad outer surfaces. Both packages utilize an identical angle of taper of the package sheets to the point of sealable engagement. In each instance, an acute angle, labelled β is defined between respective sheets 26 in Figure 3B, and 34 in Figure 3A. Referring back to Figure 2, the exterior surfaces of peripheral convex region 20 preferably define an acute angle corresponding to angle β and are therefore labelled identically, to facilitate the reduction in the size of pouch 28.

More specifically, the taper of sheets 26 and 34, respectively, begins at the tablet point bends 38 and 40, which mark the point at which the taper of the packaging sheets is set to occur. In both instances, the identical angle of taper is utilized, and it can be seen that the tablet of the present invention permits the taper to commence nearer to the centre of the tablet, thereby permitting the pouch 28 to be defined within a smaller area, and correspondingly to define a reduced volume. The configuration of tablet 10 permits the same amount of tablet material to be contained within this smaller pouch, as that contained within pouch 36 holding tablet 30. Referring now to Figures 4A and 4B, comprising plan views partly in phantom of the corresponding Figures 3A and 3B, it can be seen that the pouch 28 is reduced in area from that of pouch 36 and a corresponding reduction is possible in the overall size of sheet 26 from that of sheet 34. It should be noted that this reduction in packaging material is possible with-

out the requirement of a decrease in the diameter of the respective tablets. Thus, the surface perimeter 14 of tablet 10 is equal in size to the surface perimeter 42 of tablet 30, with the difference in the size and location of the respective tablet point bends 38 and 40, accounting for the decrease in the size of pouch 28 over pouch 36.

In addition to the reduction in the size of the packaging material, it has been found that the sheet material itself may be reduced in gauge, as the overall convexity of the outer surfaces 12 reduces the strain on the sheet materials that is normally imposed at the tablet point bend in the instance where the tablet is flat-faced, as illustrated in Figures 3A and 4A. The size of the obtuse angle that is subtended by the central and peripheral convex regions, determined with the tablet point bend 38 as its apex, is thus less than the corresponding obtuse angle that is disposed with tablet point bend 40 as its apex, in Figure 3A. The package sheet 26 is therefore less likely to rupture than corresponding package sheet 34, due to the configuration of respective tablets 10 and 30. Thus, while package sheet 34 has conventionally been prepared to a thickness of 0.001 inch gauge (0.0025 cm), package sheet 26 may be utilized at a reduced thickness of 0.0007 inch gauge (0.00178 cm gauge), and provides sufficient package strength and integrity, to resist rupture and premature package leakage.

Several other advantages have also been found with the employment of the tablets of the present invention. The problem referred to earlier with respect to tablet packaging, comprising the tendency of tablets to stack or "shim" during conveyance to the package pouch, has been virtually eliminated by the provision of the tapered surfaces of the convex broad outer surfaces 12. The tapered surfaces of the tablets allow them to slide apart from each other so that individual tablets may be efficiently packaged without jamming package machinery.

Also, the outer shape of the tablets confers a further unexpected advantage, in the instance where the tablet includes a cleansing composition that operates when the tablet is dissolved to form a cleansing solution, such as in the instance where denture cleansers, toilet bowl cleaners and the like are prepared. When the tablet is dropped into a solvent, the tendency is generally for the tablet to come to rest at the bottom of the container, resint on one of its broad surfaces. In the instance where the broad surfaces are flat, the surface area of the tablet available for interaction with the liquid in the container is limited, as the surface in contact with the bottom of the container is effectively unexposed. In contrast, the present tablet configuration presents tapered broad surfaces, that would extend away from the bottom of the container and permit the liquid in the container to make surface contact to accelerate the disintegration of the tablet.

The method of preparing the tablet of the present invention comprises the use of tablet dies defining at least one concave broad surface that

corresponds in shape to the convex broad outer surface desired in the tablet. Thus, either one or both of the broad outer surfaces may be defined in corresponding concavities within the tablet die, so that the appropriately configured tablets may be prepared. In other respects, tablet preparation does not differ from that of the prior art, as conventional tableting agents may be employed, and conventional forming pressures, etc. may be utilized. It is advisable to prepare the tablets of the present invention with essentially flat rims 16, as this prevents the occurrence of "shingling" that comprises the surface discontinuities that sometimes are formed when the tablet edge is rounded.

The tablets of the present invention may vary widely in exact shape, so long as at least one of the broad outer surfaces is convexly extended as described. Preferably, the broad outer surfaces are symmetrically convex. The exact size of central convex region 18 and/or the intermediate convex region may vary considerably, and may range in size from 20% to 80% as a radial dimension, of the total radial dimension of the broad outer surface 12. Preferably, the central and/or intermediate convex region is in the range from 30 to 70% of the total radial dimension, and more preferably is in the range from 50% to 65%. The term radial dimension will correspond to the radius when the tablet has a circular plan, and will be the dimension from the axis of the tablet to the periphery in other cases. Also, in the instance where the tablet possesses a configuration similar to that of Figure 1, with a continuous ridge 22, the location of ridge 22 naturally may vary, depending upon the size of the central convex region.

Referring now to Figure 5, the variation in the size of the respective convex region is illustrated, as peripheral convex region 20 appears larger than that in Figure 2, while the central convex region 18 is reduced. In Figure 6, a known tablet 44 is shown which utilizes broad surfaces 46 each constituted by a single convex surface. In another known tablet as illustrated in Figure 7, the tablet 48 has a single convex broad outer surface 50. This embodiment can be specifically utilized in the instance where a package such as package 52 is employed. In such package, only one of the sheets is expanded and forms a pouch, and thus a flat sheet 54 has adhesively bound thereto a convexly expanded sheet 56, which defines the recess forming the tablet pouch 58. This tablet is not particularly satisfactory for two reasons: firstly only one of the broad outer surfaces is convex, and, secondly, that one convex surface has only a single convex region.

Figure 8 of the drawings shows an embodiment somewhat similar to that shown in Figure 1, in which the tablet 10' has two identical broad outer surfaces, with a cylindrical rim 16' extending between their peripheries. A peripheral convex region 20' is frusto-conical in shape, like region 20 in Figure 1. In contrast, the central convex region 18' is substantially pyramidal in shape.

Figures 9 and 10 illustrate further embodiments, wherein the tablet is essentially rectangular in shape. Referring to Figure 9, tablet 10' defines paired broad outer surfaces 12", which can be seen to be convex, in similar fashion to surfaces 12 of Figure 1. Thus, broad outer surfaces 12" are comprised of intermediate convex regions 18", and peripheral convex regions 20" lying adjacent thereto. The separating ridge 22" may vary in configuration from that of a circle, illustrated as 22 in Figure 1 and as 22" in Figure 9, to that of a rectangle 22" in Figure 10 following essentially in parallel fashion a surface perimeter 14" in Figure 10. In the case of the embodiment of Figure 9, the peripheral convex region 20" appears as four triangular subsections equally distributed in the corners of the rectangular perimeter 14", while in Figure 10, peripheral convex region 20" is essentially rectangular and surrounds the intermediate rectangular convex region 18".

The tablets of Figures 9 and 10 differ further in the configuration of the rim 16", as it can be seen to vary in thickness from a minimal thickness at the corners of the tablet, to a maximum thickness at the points centrally intermediate the corners. The provision of a tablet in rectangular configuration as shown can be appreciated to make further economic use of the package pouch, as, in the instance where the pouch is rectangular, the shape of the tablet assures efficient utilization of defined space. The other advantages discussed above with respect to the tablet of the present invention are equally demonstrated by this further embodiment, as the convex distention of the broad outer surfaces 12" reduces the strain that is normally imposed upon the package pouch.

As noted earlier, the tablets prepared in accordance with the present invention may contain a variety of ingredients for various uses, including household and medicinal application. The present tablet configurations are particularly useful in the instance where tablets are prepared for use as, for instance, denture cleansers and toilet bowl cleaners. In such instances, the tablet-forming material may include active ingredients such as cleansers or pharmaceutical compositions, again depending upon the particular utility of the tablet.

Claims

1. A tablet comprising: two broad outer surfaces which are generally opposed to each other, are generally spaced apart from each other, and terminate in spaced-apart surface perimeters; and a continuous rim extending transversely between the surface perimeters; wherein at least one of the broad outer surfaces is distended convexly away from the other: characterised in that the at least one broad outer surface, over at least a majority of vertical planes passing through the centre of the tablet when the latter is disposed with the rim generally vertical, either (a) consists of a central convex region and a peripheral convex region adjacent thereto, the external

angle between the central convex region and the peripheral convex region being greater than 180° , or (b) comprises a central region, a peripheral convex region and, between the central and peripheral regions, an intermediate convex region, the external angle between the peripheral convex region and the intermediate convex region being greater than 180° and the external angle between the intermediate convex region and the central region also being greater than 180° .

2. A tablet according to Claim 1, wherein both of the broad outer surfaces are distended convexly away from each other thereby defining a tablet having a generally bi-convex configuration.

3. A tablet according to Claim 2, wherein the broad surfaces are symmetrically convexly distended.

4. A tablet according to Claim 1, 2 or 3, wherein the continuous rim defines a cylindrical surface which is circular or non-circular.

5. A tablet according to any preceding claim, which also includes a continuous ridge defined on the exterior of the or each convexly distended broad outer surface at the junction of the central region or intermediate convex region and the peripheral convex region.

6. A tablet according to any preceding claim, wherein regardless of whether or not there is an intermediate region between the central region and the peripheral convex region, the central region of the or each broad outer surface defines an essentially conical shape.

7. A tablet according to any one of Claims 1 to 5, wherein, regardless of whether or not there is an intermediate convex region between the central region and the peripheral convex region, the central region of the or each broad outer surface defines an essentially pyramidal shape.

8. A tablet according to any one of Claims 1 to 5, wherein the intermediate convex region, when present, of the or each broad outer surface defines an essentially frustoconical shape.

9. A tablet according to any one of Claims 1 to 5, wherein the intermediate convex region, when present, of the or each broad outer surface defines an essentially frusto-pyramidal shape.

10. A tablet according to Claim 8 or 9, wherein, centrally of the or each intermediate convex region, is a planar central region.

11. A tablet according to any preceding claim, wherein the peripheral convex region of the or each broad outer surface defines an essentially frustoconical shape.

12. A tablet according to any preceding claim, wherein the surfaces of the peripheral regions of the opposed broad outer surfaces subtend between them an acute angle.

13. A tablet according to Claim 12, wherein the acute angle is less than 45° .

14. A tablet according to any preceding claim, wherein, over at least a majority of said vertical planes, the radial dimension of the central region and/or intermediate convex region (when present) is in the range from 20% to 80% of the total radial dimension of the broad outer surface.

15. A tablet according to Claim 14, wherein, over at least a majority of said vertical planes, the radial dimension of the central region and/or intermediate convex region is in the range from 30% to 70% of the total radial dimension of the broad outer surface.

16. A tablet according to Claim 14, wherein, over at least a majority of said vertical planes, the radial dimension of the central region and/or intermediate convex region is in the range from 50% to 65% of the total radial dimension of the broad outer surface.

17. A tablet according to any preceding claim and constituted at least partially by a household cleaning composition.

18. A tablet according to any one of Claims 1 to 16 and constituted at least partially by a medicinal compound.

19. A sealably packaged tablet comprising, in combination:

a tablet package comprising opposed package sheets peripherally adhered to each other, and defining centrally between them an air-tight tablet pouch; and

a tablet according to any preceding claim, located in the tablet pouch.

20. A combination according to Claim 19, wherein the package sheets are formed of a material comprising aluminium foil.

21. A combination according to Claim 20, wherein the foil has a thickness of the order of 0.0007" gauge (0.00178 cm gauge).

22. A method of making a tablet according to any one of Claims 1 to 18, which method comprises:

providing a tablet die having a configuration complementary to that of the tablet according to any one of Claims 1 to 18 which is to be produced,

loading the tablet die with tablet-forming material, and compressing the tablet-forming material within the tablet die to form a tablet having the desired configuration specified in any one of Claims 1 to 18.

23. A method according to Claim 22, wherein the die defines concavities on both broad surfaces thereof, and

the tablet-forming material is compressed to form a tablet having two opposed, spaced-apart, convex broad outer surfaces.

Patentansprüche

1. Tablette mit zwei im allgemeinen gegenüberliegenden, im allgemeinen voneinander im Abstand befindlichen und in im Abstand befindlichen Flächenumfängen endenden äußeren Breitflächen und einem durchgehenden, quer zwischen den Flächenumfängen verlaufenden Rand, wobei zumindest eine der äußeren Breitflächen von der anderen weg konvex gewölbt ist, dadurch gekennzeichnet, daß die zumindest eine äußere Breitfläche bei sich im allgemeinen in vertikaler Position befindlichem Rand der Tablette über zumindest einen Großteil der durch den Mittelpunkt der Tablette gehenden vertikalen Ebenen entweder (a) aus einem zentralen konvexen Bereich und einem

an diesen anschließenden peripheren konvexen Bereich besteht, wobei der Außenwinkel zwischen dem zentralen konvexen Bereich und dem peripheren konvexen Bereich größer als 180° ist, oder (b) einen zentralen Bereich, einen peripheren konvexen Bereich und zwischen dem zentralen und dem peripheren Bereich einen konvexen Zwischenbereich umfaßt, wobei der Außenwinkel zwischen dem peripheren konvexen Bereich und dem konvexen Zwischenbereich größer als 180° und der Außenwinkel zwischen dem konvexen Zwischenbereich und dem zentralen Bereich ebenfalls größer als 180° ist.

2. Tablette nach Anspruch 1, bei welcher beide äußeren Breitflächen voneinander weg konvex gewölbt sind, wodurch eine Tablette von im allgemeinen bikonvexer Gestalt definiert ist.

3. Tablette nach Anspruch 2, bei welcher die Breitflächen symmetrisch konvex gewölbt sind.

4. Tablette nach Anspruch 1, 2 oder 3, bei welcher der durchgehende Rand eine kreisförmige oder nicht kreisförmige Zylinderfläche festlegt.

5. Tablette nach einem vorhergehenden Anspruch, welche weiters eine an der Außenseite der oder jeder konvex gewölbten äußeren Breitfläche am Übergang des zentralen Bereichs bzw. des konvexen Zwischenbereichs und des peripheren konvexen Bereichs festgelegte durchgehende Kante umfaßt.

6. Tablette nach einem vorhergehenden Anspruch, bei welcher der zentrale Bereich der oder jeder äußeren Breitfläche eine im wesentlichen konische Form begrenzt, unabhängig davon, ob zwischen dem zentralen Bereich und dem peripheren konvexen Bereich ein Zwischenbereich vorhanden ist oder nicht.

7. Tablette nach einem der Ansprüche 1 bis 5, bei welcher der zentrale Bereich der oder jeder äußeren Breitfläche eine im wesentlichen pyramidische Form begrenzt, unabhängig davon, ob zwischen dem zentralen Bereich und dem peripheren konvexen Bereich ein konvexer Zwischenbereich vorhanden ist oder nicht.

8. Tablette nach einem der Ansprüche 1 bis 5, bei welcher der konvexe Zwischenbereich der oder jeder äußeren Breitfläche, wenn vorhanden, eine im wesentlichen kegelstumpfförmige Form begrenzt.

9. Tablette nach einem der Ansprüche 1 bis 5, bei welcher der konvexe Zwischenbereich der oder jeder äußeren Breitfläche, wenn vorhanden, eine im wesentlichen pyramidenstumpfförmige Form begrenzt.

10. Tablette nach Anspruch 8 oder 9, bei welcher in der Mitte des oder jedes konvexen Zwischenbereichs ein planer zentraler Bereich vorhanden ist.

11. Tablette nach einem vorhergehenden Anspruch, bei welcher der periphere konvexe Bereich der oder jeder äußeren Breitfläche eine im wesentlichen kegelstumpfförmige Form begrenzt.

12. Tablette nach einem vorhergehenden An-

spruch, bei welcher die Flächen der peripheren Bereiche der gegenüberliegenden äußeren Breitflächen einen spitzen Winkel einschließen.

13. Tablette nach Anspruch 12, bei welcher der spitze Winkel kleiner als 45° ist.

14. Tablette nach einem vorhergehenden Anspruch, bei welcher die radiale Abmessung des zentralen Bereichs und/oder konvexen Zwischenbereichs (wenn vorhanden) über zumindest den Großteil der vertikalen Ebenen im Bereich zwischen 20 und 80 % der gesamten radialen Abmessung der äußeren Breitfläche liegt.

15. Tablette nach Anspruch 14, bei welcher die radiale Abmessung des zentralen Bereichs und/oder konvexen Zwischenbereichs über zumindest den Großteil der vertikalen Ebenen im Bereich zwischen 30 und 70 % der gesamten radialen Abmessung der äußeren Breitfläche liegt.

16. Tablette nach Anspruch 14, bei welcher die radiale Abmessung des zentralen Bereichs und/oder konvexen Zwischenbereichs über zumindest den Großteil der vertikalen Ebenen im Bereich zwischen 50 und 65 % der gesamten radialen Abmessung der äußeren Breitfläche liegt.

17. Tablette nach einem vorhergehenden Anspruch und zumindest teilweise aus einer Haushaltsreinigungs-Zusammensetzung bestehend.

18. Tablette nach einem der Ansprüche 1 bis 16 und zumindest teilweise aus einer medizinischen Verbindung bestehend.

19. Dichtverpackte Tablette, umfassend in Kombination

eine Tablettenpackung mit gegenüberliegenden peripher aneinanderhängenden Packungsbögen, die in der Mitte zwischen ihnen einen luftdichten Tablettenbeutel begrenzen; und eine Tablette nach einem vorhergehenden Anspruch, welche sich in dem Tablettenbeutel befindet.

20. Kombination nach Anspruch 19, bei welcher die Packungsbögen aus einem eine Aluminiumfolie umfassenden Material gebildet sind.

21. Kombination nach Anspruch 20, bei welcher die Folie eine Dicke im Bereich von 0,0007" Feinheit (0,00178 cm Feinheit) aufweist.

22. Verfahren zur Herstellung einer Tablette nach einem der Ansprüche 1 bis 18, welches Verfahren folgende Schritte umfaßt:

Bereitstellen einer Tablettenform mit einer Gestalt, die komplementär zu jener der herzustellenden Tablette nach einem der Ansprüche 1 bis 18, ist,

Füllen der Tablettenform mit einem tablettenbildenden Material und Zusammenpressen des tablettenbildenden Materials innerhalb der Tablettenform zur Formung einer Tablette mit der gewünschten, in einem der Ansprüche 1 bis 18 spezifizierten Gestalt.

23. Verfahren nach Anspruch 22, bei welchem die Form an beiden Breitflächen Konkavitäten begrenzt und das tablettenbildende Material zur Formung einer Tablette mit zwei gegenüberliegenden, im Abstand befindlichen, konvexen äußeren Breitflächen zusammengepreßt wird.

Revendications

1. Un comprimé comprenant: deux larges surfaces extérieures généralement opposées l'une à l'autre, généralement écartées l'une de l'autre et se terminant par des périmètres de surface écartés l'un de l'autre; et une bordure continue s'étendant transversalement entre les périmètres de surface; dans lequel au moins l'une des larges surfaces extérieures est éloignée de l'autre par sa convexité; caractérisé en ce qu'au moins l'une des larges surfaces extérieures, sur au moins une majorité de plans verticaux passant par le centre du comprimé lorsque celui-ci a sa bordure disposée de façon généralement verticale, est constituée soit (a) d'une région convexe centrale et d'une région convexe périphérique adjacente, l'angle extérieur formé entre la région convexe centrale et la région convexe périphérique étant supérieur à 180° , soit (b) comprend une région centrale, une région convexe périphérique et, entre les régions centrale et périphérique, une région convexe intermédiaire, l'angle extérieur formé entre la région convexe périphérique et la région convexe intermédiaire étant supérieur à 180° et l'angle extérieur formé entre la région convexe intermédiaire et la région centrale étant également supérieur à 180° .

2. Un comprimé selon la revendication 1, dans lequel les deux larges surfaces extérieures sont toutes les deux éloignées l'une de l'autre par leur convexité et définissent ainsi un comprimé ayant une configuration générale biconvexe.

3. Un comprimé selon la revendication 2, dans lequel les larges surfaces extérieures sont éloignées l'une de l'autre par une convexité symétrique.

4. Un comprimé selon la revendication 1, 2 ou 3 dans lequel la bordure continue définit une surface cylindrique qui est circulaire ou non circulaire.

5. Un comprimé selon l'une quelconque des revendications précédentes, comprenant également une bordure continue définie à l'extérieur de l'une ou de chacune des larges surfaces extérieures éloignées l'une de l'autre par leur convexité à la jonction de la région centrale ou de la région convexe intermédiaire et de la région convexe périphérique.

6. Un comprimé selon l'une quelconque des revendications précédentes dans lequel, qu'il y ait ou non une région intermédiaire entre la région centrale et la région convexe périphérique, la région centrale de l'une ou de chacune des larges surfaces extérieures définit une forme sensiblement conique.

7. Un comprimé selon l'une quelconque des revendications 1 à 5, dans lequel, qu'il y ait ou non une région convexe intermédiaire entre la région centrale et la région convexe périphérique, la région centrale de l'une ou de chacune des larges surfaces extérieures définit une forme sensiblement pyramidale.

8. Un comprimé selon l'une quelconque des revendications 1 à 5, dans lequel la région con-

vexe intermédiaire, lorsqu'elle est présente sur l'une ou chacune des larges surfaces extérieures, définit une forme sensiblement tronconique.

5 9. Un comprimé selon l'une quelconque des revendications 1 à 5, dans lequel la région convexe intermédiaire, lorsqu'elle est présente sur l'une ou chacune des larges surfaces extérieures, définit sensiblement une forme de pyramide tronquée.

10 10. Un comprimé selon la revendication 8 ou 9, dans lequel, au centre de l'une ou de chacune des régions convexes intermédiaires, se trouve une région centrale plane.

15 11. Un comprimé selon l'une quelconque des revendications précédentes, dans lequel la région convexe périphérique de l'une ou de chacune des larges surfaces extérieures définit une forme sensiblement tronconique.

20 12. Un comprimé selon l'une quelconque des revendications précédentes, dans lequel les surfaces des régions périphériques des larges surfaces extérieures opposées sous-tendent entre elles un angle aigu.

25 13. Un comprimé selon la revendication 12, dans lequel cet angle aigu est inférieur à 45° .

30 14. Un comprimé selon l'une quelconque des revendications précédentes, dans lequel, sur au moins une majorité desdits plans verticaux, la dimension radiale de la région centrale et/ou de la région convexe intermédiaire (lorsqu'elle est présente) se situe dans l'intervalle de 20 à 80% de la dimension radiale totale de la large surface extérieure.

35 15. Un comprimé selon la revendication 14, dans lequel, sur au moins une majorité desdits plans verticaux, la dimension radiale de la région centrale et/ou de la région convexe intermédiaire se situe dans l'intervalle de 30 à 70% de la dimension radiale totale de la large surface extérieure.

40 16. Un comprimé selon la revendication 14, dans lequel, sur au moins une majorité desdits plans verticaux, la dimension radiale de la région centrale et/ou de la région convexe intermédiaire se situe dans l'intervalle de 30 à 65% de la dimension radiale totale de la large surface extérieure.

45 17. Un comprimé selon l'une quelconque des revendications précédentes et constitué au moins partiellement par une composition ménagère de nettoyage.

50 18. Un comprimé selon l'une quelconque des revendications 1 à 16 et constitué au moins partiellement par un composé médicinal.

55 19. Un comprimé emballé de façon étanche qui comprend en combinaison:

— un emballage de comprimé comprenant des feuilles d'emballage opposées qui adhèrent en périphérie l'une à l'autre et définissent entre elles en leur centre une poche à comprimé étanche à l'air; et

60 — un comprimé selon l'une quelconque des revendications précédentes logé dans la poche à comprimé.

65 20. Une combinaison selon la revendication 19, dans laquelle les feuilles d'emballage sont for-

mées à partir d'un matériau comprenant une feuille d'aluminium.

21. Une combinaison selon la revendication 20, dans laquelle la feuille a une épaisseur de l'ordre de 0,0007 pouce (0,00178 cm).

22. Un procédé de préparation d'une comprimé selon l'une quelconque des revendications 1 à 18, cette méthode consistant à réaliser un moule à comprimé dont la configuration soit complémentaire de celle du comprimé selon l'une quelconque des revendications 1 à 18 que l'on doit fabriquer, à charger le moule à comprimé avec du

matériau à mouler le comprimé et à presser ce matériau à former le comprimé dans le moule à comprimé pour former un comprimé ayant la configuration recherchée spécifiée dans l'une quelconque des revendications 1 à 18.

23. Un procédé selon la revendication 22, dans lequel le moule définit des concavités sur les deux larges surfaces de celui-ci et le matériau de formation du comprimé est pressé pour former un comprimé ayant deux larges surfaces extérieures opposés, convexes, écartées l'une de l'autre.

15

20

25

30

35

40

45

50

55

60

65

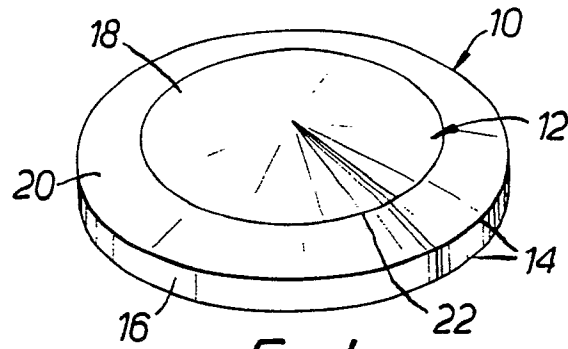


FIG. 1.

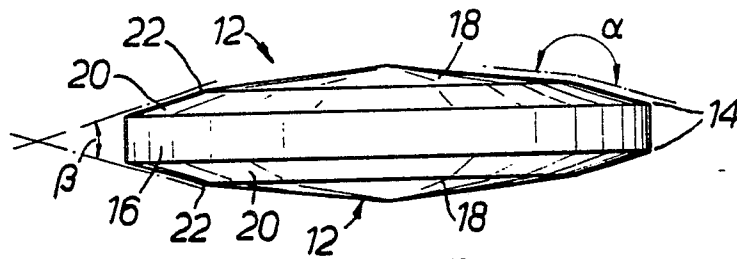


FIG. 2.

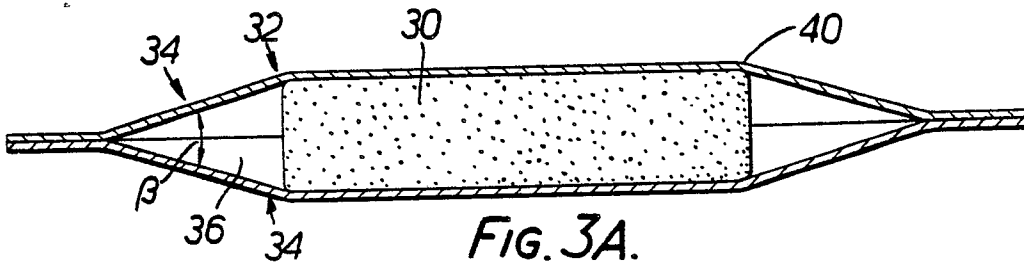


FIG. 3A.

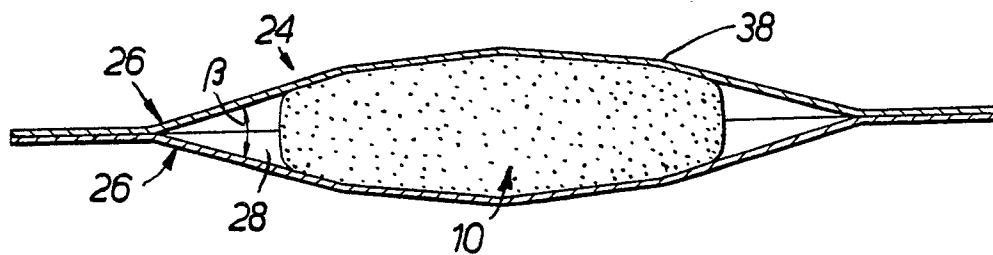


FIG. 3B.

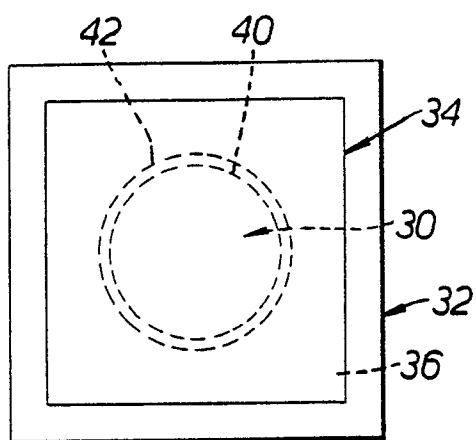


FIG. 4A.

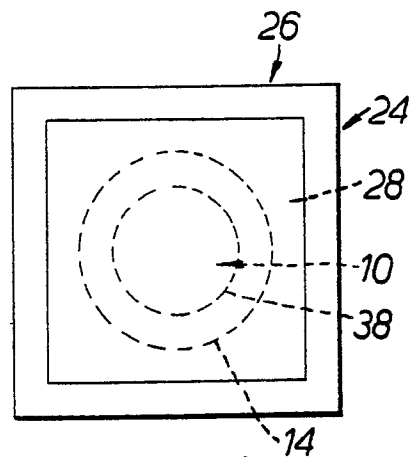


FIG. 4B.

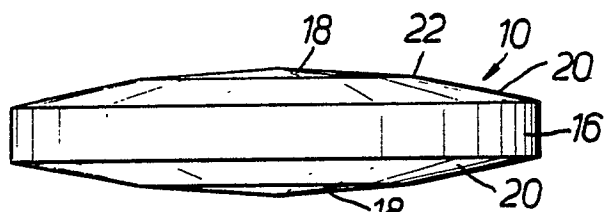


FIG. 5.

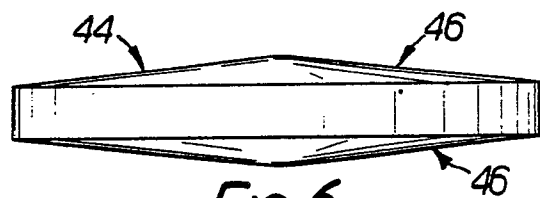


FIG. 6.

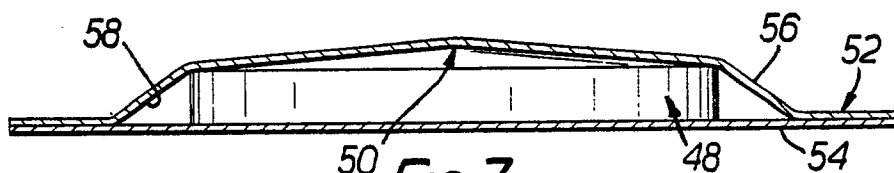


FIG. 7.

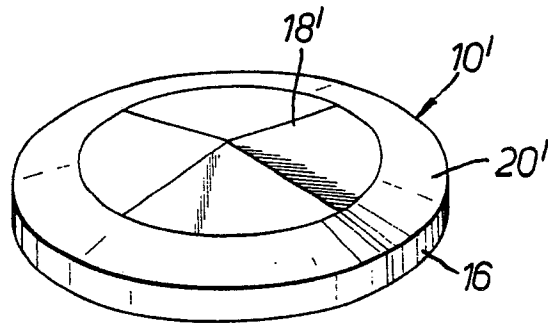


FIG. 8.

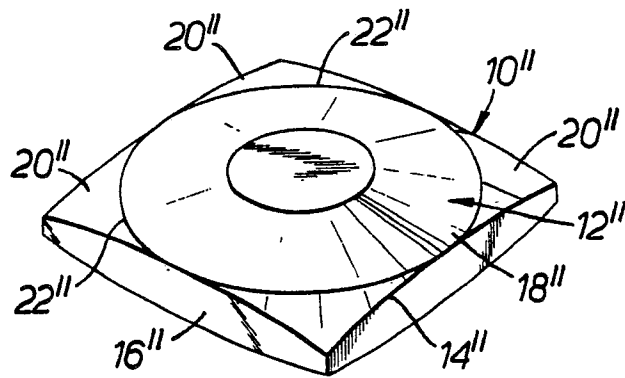


FIG. 9.

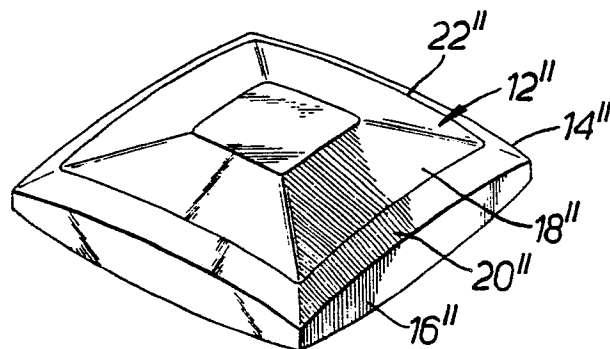


FIG. 10.