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(54) **CONTAINER FOR TAPERED FILAMENTS**

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RECIPIENT POUR FILAMENTS EFFILES

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EP 1 957 373 B1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a container for packaging bundles of filaments, and more particularly, to a plastic container for packaging a plurality of bundled tapered filaments.

BACKGROUND OF THE INVENTION

[0002] Tapered filament applications are primarily toothbrushes, paint brushes and cosmetic brushes. Tapered filaments are especially useful for toothbrushes. The tapered tips are able to reach difficult areas such as recesses between teeth and at the transitional area from gum to teeth. The tapered filaments more effectively remove dental plaque from these difficult to reach areas than filaments that are not tapered.

[0003] The current practice for packaging tapered filaments is wrapping a bundle of filaments, optionally with a rubber band then, wrapping the bundle with a paper strip, and securing the wrapped bundle with a rubber band. Then the wrapped bundles are packed in a paper pouch. The paper pouch is packed in to a paper container and the paper containers are stacked in a carton. This means of packaging is poor for tapered filaments. The ends of the tapered filaments are sensitive to very small forces and easily broken or bent. The filament ends are not protected with the current packaging. In addition, the slippery surface of the filament makes the bundles difficult to handle during packing and unpacking causing increased susceptibility to breaking or damage.

[0004] Thus, it is desirable to have an improved container for packaging tipped filament bundles such that the container securely holds the bundles while providing ease of handling bundles thus decreasing filament susceptibility to damage or breaking.

SUMMARY OF THE INVENTION

[0005] Briefly stated, there is provided an improved multi-compartmentalized container for holding bundles of filaments comprising a receiving section having a plurality of wells and a cover for the receiving section. A containan with wells is known from BE 485165 In accordance with the present invention, said wells of said receiving section contain ribs that begin at the base of said wells and extend axially up the side of said wells. The cover may have a plurality of wells with the open end of the wells aligned with the opening of the plurality of the wells in the receiving section to form a receptacle for a filament bundle.

[0006] Pursuant to a particular aspect of the present invention, there is provided an improved container for filament bundles wherein the container is formed by vacuum forming, thermoforming or injection molding.

[0007] Pursuant to another aspect of the present in-

vention, there is provided a process for removing tapered filaments bundles from a multi-compartmentalized container for holding bundles of filaments comprising a receiving section having a plurality of wells and a cover for the receiving section, as stated in appended claim 13. The cover contains a plurality of wells in an array such that when the cover is in place, an open end of each of said plurality of wells in the cover is aligned with an open end of a corresponding well in the receiving section to form a receptacle for holding a filament (e.g. fiber) bundle. The filament bundles fit into the depth of cover wells and the depth of the corresponding receiving section wells when the cover is closed over the receiving section.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The invention will be more fully understood from the following detailed description, taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of a preferred embodiment of the filament container according to the present invention;

Figure 2 is a side view of a receiving well and

Figure 3 is a side view of a cover well.

[0009] While the present invention will be described in connection with a preferred embodiment thereof, it will be understood that it is not intended to limit the invention to that embodiment. On the contrary, it is intended to cover all alternatives, modifications, and equivalents as may be included within the scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

Definitions:

[0010] The following definitions are provided as reference in accordance with how they are used in the context of this specification and the accompanying claims.

[0011] The term "well" as used herein denotes a compartment or recessed area.

[0012] The term "cover well" as used herein denotes a well in the cover.

[0013] The term "receiving well" as used herein denotes a well in the receiving section.

[0014] The term "tipped" as used herein denotes a chemically or mechanically tapered or rounded filament where the diameter of the filament gradually becomes smaller closer to the end of the filament.

[0015] The term "array" as used herein denotes a rectangular arrangement in rows and columns.

[0016] The term "PET" as used herein denotes poly (ethylene terephthalate).

[0017] The term "PETG" as used herein denotes poly (1,4-cyclohexylene dimethylene terephthalate-co-isophthalate).

[0018] The term "HIPS" as used herein denotes high impact polystyrene.

[0019] The term "OPS" as used herein denotes oriented polystyrene.

[0020] The term "PVC" as used herein denotes polyvinylchloride.

[0021] The term "PC" as used herein denotes polycarbonate.

[0022] The term "PMMA" as used herein denotes poly(methyl methacrylate).

[0023] The term "PP" as used herein denotes polypropylene.

[0024] The term "rib" as used herein denotes a long, narrow member projecting from the surface of a well serving to guide the filament bundles when inserting the filament bundle in to the well.

[0025] The term "bundle" as used herein denotes a group of filaments fastened together for convenient handling.

[0026] The term "multi-compartmentalized" as used herein denotes containing at least two separate recessed areas for holding filament bundles.

[0027] The term "mm" as used herein denotes millimeters.

[0028] A container according to the preferred embodiment of the present invention comprises a multi-compartmentalized container for packaging bundles of tapered filaments having a bottom receiving section and a cover. The receiving section has a plurality of wells. Typically, the number of wells in the receiving section will depend on the size of the bundles and the number of bundles to be packaged. Typically, the wells in the receiving section are arranged in an array (i.e. a well-regulated and arranged order).. The cover may or may not contain wells depending on the length of the bundles and the depth of the wells in the receiving section.

[0029] In the event that the cover also contains wells, the cover wells are in an array such that, when the cover is in place, the open end of each well in the cover is aligned with the open end of a well in the receiving section to form a receptacle for a fiber bundle.

[0030] The multi-compartmentalized container can be made from a thermoplastic polymer. Preferably the thermoplastic is selected from PET, PETG, HIPS, OPS, PVC, PC, PMMA and PP. One particular type of HIPS that can be used is K-resin®, a clear HIPS produced by Phillips 66. The multi-compartmentalized container can be formed in a variety of ways including vacuum forming, thermoforming, or injection molding.

[0031] Reference is now made to the drawings for a detailed description of the present invention.

[0032] Reference is now made to Figure 1 which shows a perspective view of a preferred embodiment of the filament container 10 according to the present invention. The embodiment shown in Figure 1 generally defines a rectangular container having a bottom receiving section 12 containing a plurality of filament bundle receiving wells 18 and a top cover 14 containing a plurality

of wells 20. A more detailed drawing of the bundle receiving well 18 is in Figure 2. The cover and receiving section are optionally connected by a hinge 16. The wells in the receiving section 12 have a depth of at least 66% of the total filament length. When the wells 18 in the receiving section 12 have a depth of 100% of the total filament length, the cover is a flat sheet. The wells in the receiving section 12 have gradually tapered ribs 26, as shown in Figure 2, that guide the bundled filaments into the receiving well 18. The ribs 26 begin and are widest at the base 28 of the well 18 in the receiving section 12. The ribs 26 gradually taper as they extend axially up the sides of the receiving well 18 not to exceed 50% of the total receiving well 18 height. The ribs 26 aid in receiving the filament bundle to be stored therein. The well diameter is sufficient to allow the bundles to fit securely into the receiving well 18. The close fit of the well diameters keeps the bundles securely in place thus, decreasing filament susceptibility to damage or breaking. The well diameter is generally at least 30 mm in order to accommodate common filament bundle sizes.

[0033] Figure 3 shows a side view of a well 20 embodiment in the cover 14. The depth of the wells 20 in the cover 14 is from 0 to 33% of the total filaments length. If the depth of the wells 20 on the cover 14 equals 0 then the cover is a flat sheet, which can be replaced with paperboard. One advantage to having cover wells 20 with a depth greater than 0 is easy removal of the tapered filament bundles. The bundles can be difficult to remove from the container from the tipped ends side of the filaments. The tipped ends are susceptible to breaking and the slippery nature of the ends makes the bundles difficult to grasp. The new packaging overcomes this problem by placing the larger untipped ends of the filament bundle in the receiving wells 18. When the bundles are to be unpacked, the container is turned upside down such that the receiving section 12 is on top and the cover 14 is on the bottom. The receiving wells end is lifted to open the container 10 exposing the untipped ends. Then, the bundles can be easily removed from the cover wells 20 of the container by grasping the untipped ends protruding therefrom.

[0034] Additionally, a cover 14 containing wells 20 is also an advantage for filaments that have both ends tipped since the depth of the cover wells 20 is up to 33% of the total filament length, at least 66% of the filament bundle length is protruding from the cover wells 20 when the container is inverted. As such, the bundles are easily grasped even when both filament ends are tipped.

[0035] The cover 14 may be fastened to the receiving section 12 using any suitable device known in the art such as hinges, studs, and fasteners. Preferably, a cooperating press-stud-fastening device is used. The cover 14 then comprises a convex stud 24 projecting outward from the underside of the cover 14. The receiving section 12 comprises a concave stud 22 projecting inward to the interior of the receiving section 12 and is arranged to engage with the stud 24 on the cover 14. The press-stud

fastening device can be located along the free edges of the container. The container can have 1-4 press-stud-fastening devices on each free side depending on the length of the free side.

[0036] It is therefore, apparent that there has been provided in accordance with the present invention, a container for protecting filament bundles that fully satisfies the aims and advantages hereinbefore set forth. While this invention has been described in conjunction with a specific embodiment thereof, it is evident that many alternatives, modifications, and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the scope of the appended claims.

Claims

1. A multi-compartmentalized container (10) for holding bundles of filaments comprising:

- a. a receiving section (12) having a plurality of wells (18) and
- b. a cover (14) for said receiving section (12),

characterized in that

said wells (18) of said receiving section (12) contain ribs (26) that begin at the base (28) of said wells (18) and extend axially up the sides of said wells (18).

2. The multi-compartmentalized container (10) according to claim 1, further comprising a hinge (16) connecting said receiving section (12) and said cover (14).
3. The multi-compartmentalized container (10) according to claim 1, wherein said cover (14) contains a plurality of wells (20) in an array such that, when the cover (14) is in place, an open end of each of said plurality of wells (20) in the cover (14) is aligned with an open end of a corresponding well (18) in the receiving section (12) to form a receptacle for holding a filament bundle, said wells (20) of the cover (14) having a depth and said wells (18) of the receiving section (12) having a depth.
4. The multi-compartmentalized container (10) according to claim 1, wherein the depth of said wells (18) in said receiving section (12) is at least 66% of a total filament length contained in the filament bundle.
5. The multi-compartmentalized container (10) according to claim 3, wherein the depth of said wells (20) in said cover (14) is 0 to 33% of a total filament length contained in the filament bundle.
6. The multi-compartmentalized container (10) according to claim 1, wherein said wells (18, 20) in said

receiving section (12) and in said cover (14) have a diameter of at least 30 mm.

7. The multi-compartmentalized container (10) according to claim 1, wherein the filament bundle comprises a plurality of filaments, said filaments being tipped.
8. The multi-compartmentalized container (10) according to claim 1, wherein said container (10) is formed from a thermoplastic material.
9. The multi-compartmentalized container (10) according to claim 8, wherein said thermoplastic material is selected from the group consisting of PET, PETG, HIPS, OPS, PVC, PC, PMMA and PP.
10. The multi-compartmentalized container (10) according to claim 5, wherein said container is vacuum formed, thermoformed or injection molded.
11. The multi-compartmentalized container (10) according to claim 1, wherein said axially extending ribs (26) are tapered having the widest part of said rib (26) being at the base (28) of said well (18).
12. The multi-compartmentalized container (10) according to claim 3, wherein said container (10) comprises a cooperating press-stud-fastening device (22, 24) in order to secure said cover (14) to said receiving section (12).
13. A process for removing tapered filament bundles from the container (10) of claim 3, comprising the steps of:
 - a. inverting said container (10) such that said receiving section (12) is on top and said cover (14) is on the bottom;
 - b. exposing the filament bundles by opening or removing said receiving section (12); and
 - c. grasping the bundles by the ends protruding from the wells (20) of said cover (14).

Patentansprüche

1. Mehrfach unterteilter Behälter (10) zum Halten von Bündeln von Fasern, der Folgendes umfasst:
 - a. eine Aufnahmesektion (12), die mehrere Vertiefungen (18) hat, und
 - b. eine Abdeckung (14) für die Aufnahmesektion (12),

dadurch gekennzeichnet, dass

die Vertiefungen (18) der Aufnahmesektion (12) Rippen (26) enthalten, die an der Basis (28) der Vertiefungen (18) beginnen und sich in Axialrichtung die

Seiten der Vertiefungen (18) hinauf erstrecken.

2. Mehrfach unterteilter Behälter (10) nach Anspruch 1, der ferner ein Scharnier (16) umfasst, das die Aufnahmesektion (12) und die Abdeckung (14) verbindet. 5
3. Mehrfach unterteilter Behälter (10) nach Anspruch 1, wobei die Abdeckung (14) mehrere Vertiefungen (20) in einer Gruppierung umfasst derart, dass, wenn sich die Abdeckung (14) an ihrem Platz befindet, ein 10
offenes Ende jeder der mehreren Vertiefungen (20) in der Abdeckung (14) mit einem offenen Ende einer entsprechenden Vertiefung (18) in der Aufnahmesektion (12) ausgerichtet ist, um einen Köcher zum Halten eines Faserbündels zu bilden, wobei die Vertiefungen (20) der Abdeckung (14) eine Tiefe haben und die Vertiefungen (18) der Aufnahmesektion (12) eine Tiefe haben. 15
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4. Mehrfach unterteilter Behälter (10) nach Anspruch 1, wobei die Tiefe der Vertiefungen (18) in der Aufnahmesektion (12) wenigstens 66 % einer in dem Faserbündel enthaltenen Gesamtfaserlänge beträgt.
5. Mehrfach unterteilter Behälter (10) nach Anspruch 3, wobei die Tiefe der Vertiefungen (20) in der Abdeckung (14) 0 bis 33 % einer in dem Faserbündel enthaltenen Gesamtfaserlänge beträgt. 30
6. Mehrfach unterteilter Behälter (10) nach Anspruch 1, wobei die Vertiefungen (18, 20) in der Aufnahmesektion (12) und der Abdeckung (14) einen Durchmesser von wenigstens 30 mm haben. 35
7. Mehrfach unterteilter Behälter (10) nach Anspruch 1, wobei das Faserbündel mehrere Fasern umfasst, wobei die Fasern angespitzt sind. 40
8. Mehrfach unterteilter Behälter (10) nach Anspruch 1, wobei der Behälter (10) aus einem thermoplastischen Werkstoff geformt ist.
9. Mehrfach unterteilter Behälter (10) nach Anspruch 8, wobei der thermoplastische Werkstoff aus der Gruppe ausgewählt ist, die aus PET, PETG, HIPS, OPS, PVC, PC, PMMA und PP besteht. 45
10. Mehrfach unterteilter Behälter (10) nach Anspruch 5, wobei der Behälter vakuumgeformt, warm geformt oder spritzgegossen ist. 50
11. Mehrfach unterteilter Behälter (10) nach Anspruch 1, wobei die sich in Axialrichtung erstreckenden Rippen (26) verjüngt sind, wobei sich der breiteste Teil der Rippen (26) an der Basis (28) der Vertiefung (18) befindet. 55

12. Mehrfach unterteilter Behälter (10) nach Anspruch 3, wobei der Behälter (10) eine zusammenwirkende Druckknopf-Befestigungseinrichtung (22, 24) umfasst, um die Abdeckung (14) an der Aufnahmesektion (12) zu befestigen.

13. Verfahren zum Entnehmen von verjüngten Faserbündeln aus dem Behälter (10) nach Anspruch 3, das die folgenden Schritte umfasst:

- a. das Umdrehen des Behälters (10) derart, dass sich die Aufnahmesektion (12) oben befindet und sich die Abdeckung (14) unten befindet,
- b. das Freilegen der Faserbündel durch das Öffnen oder Entfernen der Aufnahmesektion (12) und
- c. das Ergreifen der Bündel an den aus den Vertiefungen (20) der Abdeckung (14) vorspringenden Enden.

Revendications

1. Récipient à compartiments multiples (10) pour contenir des faisceaux de filaments comprenant:

- a. une section de réception (12) possédant une pluralité de puits (18) et
- b. un couvercle (14) pour ladite section de réception (12),

caractérisé en ce que:

lesdits puits (18) de ladite section de réception (12) contiennent des picots (26) qui commencent au fond (28) desdits puits (18) et s'étendent dans la direction axiale jusqu'en haut des côtés desdits puits (18).

2. Récipient à compartiments multiples (10) selon la revendication 1, comprenant en outre une charnière (16) reliant ladite section de réception (12) et ledit couvercle (14).

3. Récipient à compartiments multiples (10) selon la revendication 1, dans lequel ledit couvercle (14) contient une pluralité de puits (20) en un arrangement de sorte que, lorsque le couvercle (14) est en place, une extrémité ouverte de chacun de ladite pluralité de puits (20) dans le couvercle (14) est alignée avec une extrémité ouverte d'un puits correspondant (18) dans la section de réception (12) pour former un réceptacle permettant de contenir un faisceau de filaments, lesdits puits (20) du couvercle (14) possédant une profondeur et lesdits puits (18) de la section de réception (12) possédant une profondeur.

4. Récipient à compartiments multiples (10) selon la

revendication 1, dans lequel la profondeur desdits puits (18) dans ladite section de réception (12) est d'au moins 66% d'une longueur totale de filament contenue dans le faisceau de filaments.

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5. Récipient à compartiments multiples (10) selon la revendication 3, dans lequel la profondeur desdits puits (20) dans ledit couvercle (14) est de 0 à 33% d'une longueur totale de filament contenue dans le faisceau de filaments.

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6. Récipient à compartiments multiples (10) selon la revendication 1, dans lequel lesdits puits (18, 20) dans ladite section de réception (12) et dans ledit couvercle (14) possèdent un diamètre d'au moins 30 mm.

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7. Récipient à compartiments multiples (10) selon la revendication 1, dans lequel le faisceau de filaments comprend une pluralité de filaments, lesdits filaments étant pointus.

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8. Récipient à compartiments multiples (10) selon la revendication 1, où ledit récipient (10) est formé à partir d'un matériau thermoplastique.

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9. Récipient à compartiments multiples (10) selon la revendication 8, dans lequel ledit matériau thermoplastique est choisi dans le groupe constitué de PET, PETG, HIPS, OPS, PVC, PC, PMMA et PP.

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10. Récipient à compartiments multiples (10) selon la revendication 5, où ledit récipient est formé sous vide, thermoformé ou moulé par injection.

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11. Récipient à compartiments multiples (10) selon la revendication 1, dans lequel lesdits picots s'étendant dans la direction axiale (26) sont effilés, la partie la plus large dudit picot (26) étant au fond (28) dudit puits (18).

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12. Récipient à compartiments multiples (10) selon la revendication 3, où ledit récipient (10) comprend un dispositif de fermeture à bouton-pression coopérant (22, 24) dans le but de fixer ledit couvercle (14) à ladite section de réception (12).

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13. Procédé pour retirer des faisceaux de filaments effilés à partir du récipient (10) selon la revendication 3, comprenant les étapes:

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- a. de renversement dudit récipient (10) de sorte que ladite section de réception (12) est en haut et que ledit couvercle (14) est en bas;
- b. d'exposition des faisceaux de filaments en ouvrant ou en retirant ladite section de réception (12), et
- c. de saisie des faisceaux par les extrémités dé-

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passant des puits (20) dudit couvercle (14).

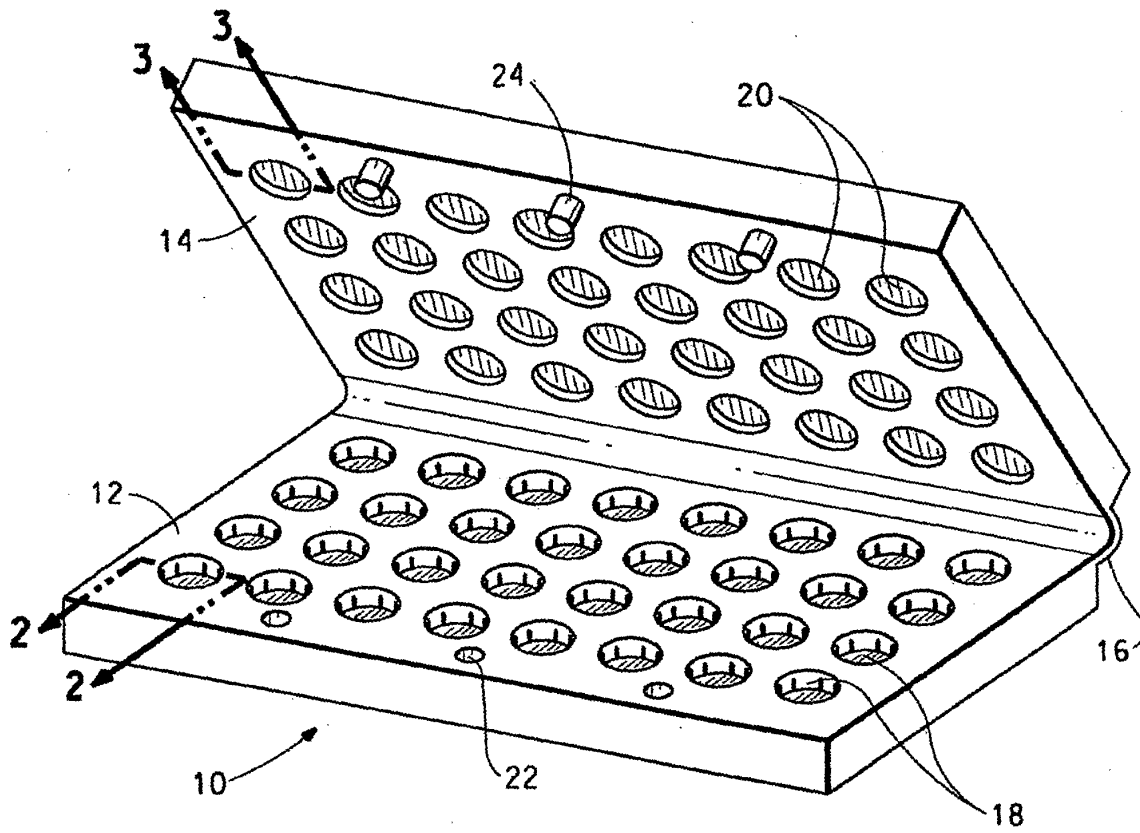


FIG. 1

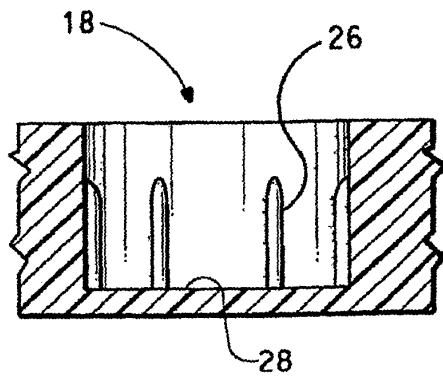


FIG. 2

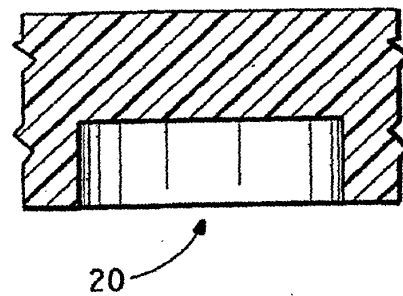


FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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