June 27, 1972 M. C. WILSON 3,672,720

MULTI-PURPOSE ARTICLES OF FURNITURE

Filed Nov. 5, 1970

FIG. 1

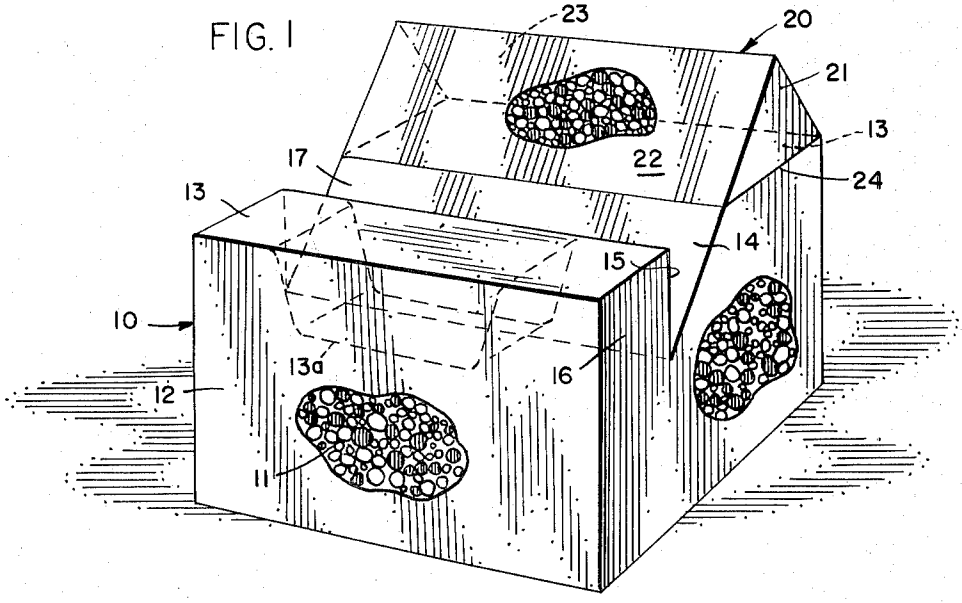


FIG. 2

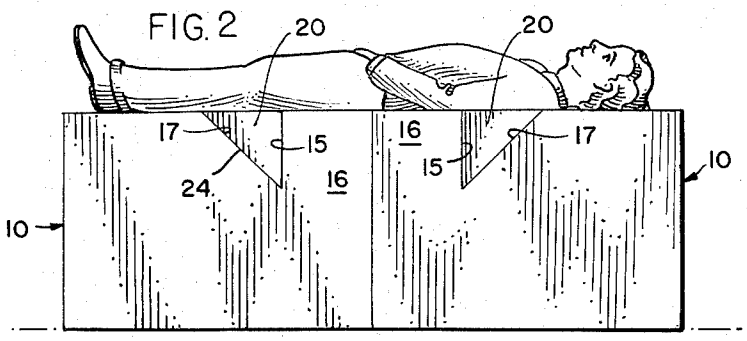


FIG. 3

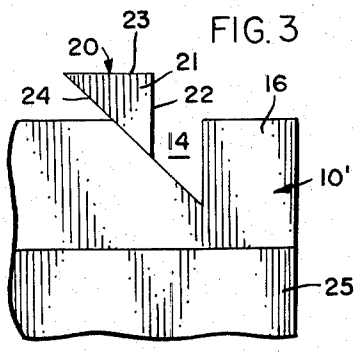


FIG. 4

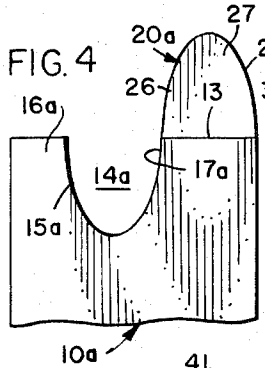


FIG. 5

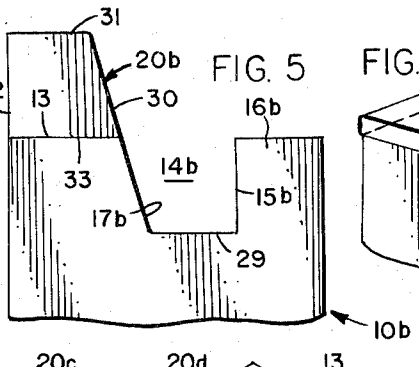


FIG. 6

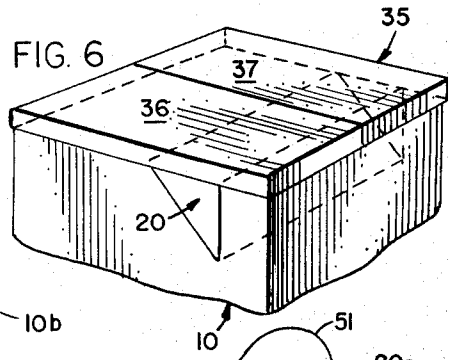


FIG. 7

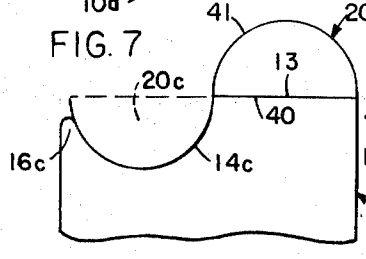


FIG. 8

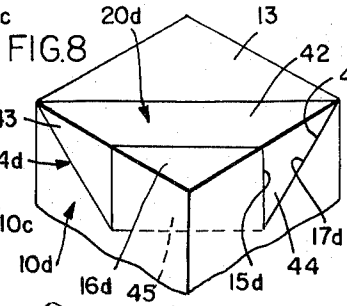
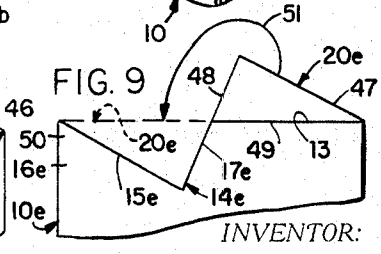


FIG. 9



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United States Patent Office 3,672,720
Patented June 27, 1972

3,672,720

MULTI-PURPOSE ARTICLES OF FURNITURE

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Filed Nov. 3, 1970, Ser. No. 86,455
Int. Cl. A47c *13/00*
U.S. Cl. 297—118 2 Claims

ABSTRACT OF THE DISCLOSURE

Multi-purpose articles of furniture convertible from back-supporting seating members to beds, stools, etc., and vice versa, by selective positioning of a bolster pad removably nested in a channel or trough in the upper, body-supporting surface of the article.

INTRODUCTION

The invention herein is concerned with articles of furniture, i.e., chairs, sectional sofas, non-sectional sofas, etc. At least the upper portions of these articles are composed of a yieldable, resilient member, e.g., a cellular block of a foamed elastomer such as polyurethane foam or of an inflatable shell of flexible, thermoplastic polymer sheeting. A bolster pad is nested matingly in the upper, body-supporting surface of the member in a channel or trough extending laterally across the upper surface. The bolster pad is made of a foamed elastomer or as an inflatable shell.

When the bolster pad is nested in the channel or trough, the furniture unit has a substantially flat or planar upper surface, making it useful as a stool-like seat or as a bed. When the bolster pad is removed from the channel and laid across the rear portion of the upper surface, the article is converted into a comfortable chair or other type seating furniture with back support.

In recent years there has been growing interest in free form shapes of fabric covered, blocks or pieces of foamed elastomer or inflatable vinyl members which, when sat upon, reshape under a person's weight into a body supporting seat. In their normal or predeformation form, they bear little, if any, resemblance to the conventional shapes of chairs, sofas, etc. Examples of these free form seating articles are the spherical, hemispherical-cylindrical, semicylindrical-cubic and cubic forms illustrated and described in U.S. Pat. No. 3,476,497, issued Nov. 4, 1969. The general concept of the seating furniture of this patent is of providing a large void or a plural number of voids within a body of foamed elastomer so that the void or voids collapse and virtually disappear when weight is placed upon the seat portion of the furniture, which deforms resiliently into a body-conforming, weight-supporting shape.

THE INVENTION HEREIN

This invention provides multi-purpose articles of furniture comprising a body support member having a resilient, deformable upper portion with an upper, body-supporting surface. This surface preferably is substantially flat. The upper portion and the upper surface have an upwardly opening channel extending laterally in the member in rearwardly spaced relationship to the upper front side of the body-support member. The upper front side of the body-support member has a resilient, deformable, upwardly extending leg defined by the upper portion of the front side of the member and the contiguous, front wall of the channel. This upwardly extending leg is deformable under the weight of a person sitting thereon into an upper thigh and/or buttock-conforming shape.

A removable, resilient bolster pad of substantially mating shape and dimensions to the channel is seated in the channel with the upper surface thereof substantially flush with the upper, body-supporting surface. When the article of furniture is to be used as a bed or a stool or other non-back supporting piece of furniture, the pad is seated in the channel. When it is to be used as a back-supporting piece of seating furniture, e.g., a chair, couch, sectional sofa, etc., the pad is placed on the rear portion of the upper body-supporting surface to serve as an upper back-supporting member.

In one of the preferred forms of the invention, the aforesaid channel has a substantially vertical front wall and a rear wall sloping upwardly and rearwardly from the front wall to the upper seating surface. In transverse cross section, this channel has a substantially right-triangular configuration with the hypotenuse being the rear wall of the channel. The bolster pad has a similar transverse cross section.

It is further preferred that the depth of the rear portion of the upper, body-supporting surface between the line of intersection therewith by the rear wall of the channel and the rear side of the body-supporting member be substantially equal to one of the dimensions of the planar sides of the pad. With the aforesaid right-triangular pad this dimension is substantially equal to the hypotenuse of the pad which is also the width dimension of the rear wall of the channel. With other cross-sectional configurations of the channel, e.g., substantially U or substantially parabolic, trapezoidal, rectangular or the like, the depth of the rear portion of the upper surface preferably corresponds substantially to the length of one of the flat sides of the pad.

At least the upper portion of the articles of furniture of the invention is made of a deformable, body-supporting, resilient material or structure. In terms of permanency, durability, body-conforming deformability and the like, the best material is a cellular foam elastomer member, e.g., foam rubber, foam polyurethane and the like. The entire article may be made of such cellular foam material or the lower base portion may be made of other materials forming a rigid or resilient base upon which the cellular foam upper portion is supported. In the most preferred forms of the invention, the entire article of furniture is made of a cellular, foam elastomer block, preferably one which is a substantially rectangular parallelepiped.

The channel preferably extends the full width of the body-supporting surface, intersecting the two sides of the article. It is within the contemplation of the invention however, that the channel stop short of either or both sides to provide an arm rest or rests.

DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention are illustrated in the drawing wherein:

FIG. 1 is a perspective view of the most preferred form of the invention in the form of a chair with the right-triangular bolster pad removed from the right-triangular channel and placed in back-supporting position on the rear portion of the upper, body-supporting surface;

FIG. 2 illustrates in side elevation the use of two of the chains of FIG. 1 as a bed;

FIG. 3 is a fragmentary, side elevation of a chair similar to FIG. 1 with the bolster pad oriented to provide a more vertical back support and also with a foam elastomer upper cushion resting on a base of different construction;

FIGS. 4 and 5 are fragmentary views in side elevation of alternative forms of transverse cross sections for the channels and bolster pads;

FIG. 6 is a fragmentary perspective view showing another use for the article of furniture of the invention, i.e., as a pedestal for a table top; and

FIGS. 7–9 illustrate in fragmentary side elevation or fragmentary top perspective three additional embodiments of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings, the embodiment of FIGS. 1–3 is an article of seating furniture convertible into a bed, stool and the like in the form of a chair. The chair may typically have dimensions as follows: width 30–42"; depth 30–42"; and height 16–24". Placed side-by-side, a plurality of the illustrated chairs may be used as the sectional pieces of a sectional sofa or couch. Alternatively, a one-piece sofa or couch may be provided simply by increasing the width dimension.

The article of seating furniture **10** is composed of a block or body **11** of cellular, foam elastomer such as polyurethane foam. This foam elastomer is resiliently deformable under the weight of a person seated or lying on the article **10**. The body or block **11** preferably is covered with an aesthetically pleasing fabric on at least the exposed surfaces thereof, which fabric covering preferably is removable for ease of cleaning or replacement. The latter may be achieved by completely encapsulating the body or block **11** with the fabric cover and providing on the underside of the block or body **11** a zipper, snap fasteners or the like near at least three edges of the underside to permit the fabric cover to be slipped upwardly and off the body or block **11**.

FIGS. 1 and 3 show the article **10** with its bolster pad **20** positioned for use of the article as a back-supporting seat. The upper front portion of the article **10** is a resiliently deformable, upwardly extending leg **16** of cellular foam elastomer, the upper surface **13** of which will deform into an upper thigh or buttock-conforming shape **13***a* when a person sits thereon. The upwardly extending leg **16** is defined by the upper portion of the front side of the body support article **10** and the contiguous, substantially vertical, front wall **15** of a channel or trough **14**. The latter extends laterally across the entire width of the article **10**, i.e., from one side to the other side, but may, if desired, terminate short of either or both sides to provide arm rests if the latter are desired.

The rear wall **17** of the channel or trough **14** slopes upwardly and rearwardly from the bottom of the front wall **15** to the upper body-supporting surface **13**. In transverse cross section, the channel or trough **14** has the shape of a right-triangle with the hypotenuse being the upwardly sloping rear wall **17**.

A bolster pad **20** is removably and substantially matingly nested in the channel or trough **14**. The pad **20** is made of cellular foam elastomer with a fabric covering thereon. Its length and transverse cross section dimensions correspond substantially to that of the trough or channel **14** as can be seen in FIG. 2. In this figure, two of the articles **10** are placed together to form a bed. In such placement, the troughs or channels **14** and the nested pads **20** extend transversely of the bed for purposes of maximum comfort to a person lying thereon. They may extend longitudinally, however, if desired.

The bolster pad **20** is positioned on the rear portion of the upper surface **13** in the manner illustrated in FIG. 1 or is moved only partially upwardly and rearwardly in the channel or trough **14** as illustrated in FIG. 3 when the article is used for a back-supporting chair or other seat. The position in FIG. 1 provides a reclining back support with the right angle corner **21** of the bolster pad providing its apex. The sides **22** and **23** of the bolster bed correspond in dimensions to the vertical side **15** and the maximum width of the trough or channel **14**, i.e., in the plane of the upper, body-supporting surface **13**. Preferably the width of the side **15** and the maximum width of the trough or channel **14** are substantially equal, whereby the sides **22** and **23** of the bolster pad are of equal width and the bolster pad is, in transverse cross section, substantially an isoceles, right triangle.

The third side **24** is the hypotenuse or base of the triangle and corresponds in width substantially to the width of the side **17** of the trough or channel **14**. The depth of the rear portion of the upper, body-supporting surface **13**, i.e., that between the intersection therewith by the rear wall **17** and the rear side of the article **10** preferably is substantially equal to the width of the hypotenuse side **24** of the bolster pad **20** and correspondingly also the width of the rear wall **17** of the channel or trough **14**. These relationships give an aesthetically pleasing appearance to the article when the bolster pad is positioned as illustrated in FIG. 1 and further provides a maximum area for frictional restraint between the rear portion of the upper surface **13** and the side **24** of the pad against slippage when a person is seated thereon.

With the bolster pad positioned as illustrated in FIG. 1, the side **22** of the pad **20** (or the side **23** if the pad is rotated 180° about a vertical axis) is substantially planar with and forms an extension of the rear wall **17** of the trough or channel **14**. The back of a person seated thereon is supported in the lower back area by the rearwardly inclined wall **17** while the upper back area may rest against the side **22** (or **23**) of the bolster pad **20**.

The article thus provides three primary areas of body support to a person seated thereon, i.e., the upper thigh and/or lower buttock area on the resiliently deformed surface **13***a* of the upwardly extending leg **16**, the lower back area on the rearwardly inclined surface of the side **17** of the channel or trough **14**, and the upper back area on the rearwardly inclined side **22** (or **23**) of the bolster pad **20**. The buttock area directly beneath the lower area of the spine lies in the trough or channel **14** so that there is no directly downwardly body weight thrust on the lower end of the spline.

Should a more erect back support be desired, the bolster pad **20** may be moved partially rearwardly and upwardly out of the trough or channel **14** as shown in FIG. 3, whereby the weight of the seated person is distributed primarily in the upper thigh and lower buttock area on the leg **16** and in the middle area of the back against the substantially vertical side **22** of the bolster pad **20**. Alternatively, the pad **20** may be shifted forwardly on the upper surface **13** with its forward edge projecting over the through or channel to provide back support for a more erect sitting position. For more casual sitting positions, the bolster pad **20** (or even two bolster pads) may be placed in an infinite number of angular positions on the rear portion of the upper surface on any of its or their sides or faces.

FIG. 3 further illustrates an alternative form of the invention whereby the article of furniture has a base **25** which may be non-resilient or resilient and of different construction from the upper portion of the article. In this case, the upper portion **10'** constitutes a pad of fabric-covered, cellular foam elastomer having the trough or channel **14** and matingly nested bolster pad **20** therein.

The embodiments of FIGS. 4 and 5 illustrate alternative shapes for the cross section of the trough or channel and the matingly nested bolster pad. In FIG. 4, the trough or channel **14***a* has a transverse cross section which is substantially U-shaped, e.g., a substantially parabolic

shape. The upwardly extending leg **16***a* is defined by the front side of the article **10***a* and the contiguous, downwardly sloping side **15***a* of the trough or channel **14***a*. The bolster pad **20***a* has a transverse cross section corresponding substantially to that of the transverse cross section of the channel or trough **14***a*. It is preferably substantially symmetric in transverse cross section, provided by substantially identical front and rear walls **26** and **28** connected by a rounded bight portion **27**. The width of the pad **20***a* at its base preferably is substantially equal to the depth of the rear portion of the upper surface **13**.

The embodiment of FIG. 5 is similar to those of the previous embodiments, the variable being a trough or channel **14** of substantially trapezoidal cross section and a bolster pad **20***b* of similar trapezoidal, transverse cross section. Reference numerals **15***b*, **16***b* and **17***b* correspond to similar parts **15–17** and **15***a*–**17***a* of the earlier embodiments. The longer, non-parallel side **30** of the bolster pad corresponds substantially in dimensions with the upwardly and rearwardly sloping rear wall **17***b* of the trough or channel **14***b* and dies substantially coplanar therewith when the pad is positioned as shown in FIG. 5. The opposite side **32** of the pad **20***b* lies substantially flush with the rear side of the article **10***b*. The wider side **33** of the two parallel sides of the trapezoid rests on the rear portion of the upper surface **13** to provide the maximum area of friction contact between these surfaces. The width of the narrower side **31** corresponds substantially to the width of the bottom wall **29** of the channel or trough **14***b*.

The vertical legs **16**, **16***a*, and **16***b* have a width of about 8" to 12", preferably about 9", and a height (as measured from the bottom of troughs or channeds **14**, **14***a* and **14***b*) of about 8" to 12", preferably about 10" to 12".

FIG. 6 illustrates the use of the articles of the invention as the base or pedestal of table **35**. The table top may be a one-piece top, or as illustrated, a two-piece top composed of equal sections **36** and **37**. The latter have the advantage of being more easily stored when the article **10** is not used for table purposes.

In the embodiment of FIG. 7, the channel or trough **14***c* is of substantially semicircular transverse cross section, as is the transverse cross section of the bolster pad **20***c*. When used as a bed or stool, the bolster pad **20***c* is seated in the substantially semi-cylindrical trough or channel **14***c* of the article **10***c* as shown in phantom lines in FIG. 7. When used as a back-supporting seat, the first surface **40** of the substantially semi-cylindrical pad **20***c* is laid on the rear portion of the upper surface **13** of the article **10***c*, with the curved side **41** constituting the upper backrest support. In this embodiment the front, upwardly extending leg **16***c* is considerably smaller in transverse cross section and hence has a considerably lesser weight-supporting quality than do the legs **16**, **16***a* and **16***b* of the previous embodiments. The leg **16***c* deforms downwardly approximately even with the bottom of the trough or channel **41***c* and hence the body weight distribution is substantially continuous across the upper thigh through lower back areas of the seated person.

The embodiment of FIG. 8 is similar to the embodiment of FIGS. 1–3 except that the trough or channel **14***d* extends diagonally across the body-supporting surface **13** of the article **10***d*. The rear edge of the trough or channel **14***d* extends diagonally corner to corner. The trough or channel has a substantially vertical, diagonally lateral front wall **15***d* and a rearwardly and upwardly sloping rear wall **17***d* also extending diagonally laterally across the article **10***d*.

The bolster pillow **20***d* is matingly seated in the diagonal channel or trough **14***d*. It has a prismoid configuration provided by its five sides, i.e., the triangular side faces **43** and **44**, the regular trapezoidal faces **42** and **46**, and the rectangular face **45**. When the article **10***d* is used as a back-supporting seat, the bolster pad **20***d* is rotated 180° about its longitudinal axis and placed on the rear triangular portion of the upper surface **13** with the face **42** resting thereon. The front, vertical leg **16***d* supports all or part of the upper thighs and has a right angle, isoceles triangular horizontal cross section.

The embodiment of FIG. 9 is similar to the embodiment of FIG. 7. The primary difference resides in the transverse cross section of the lateral trough or channel **14***e* and the bolster pad **20***e*. Here these elements have an acute triangular configuration provided by the downwardly and rearwardly sloping front-bottom wall **15***e* of the trough or channel **14***e* and the upwardly and preferably rearwardly sloping rear wall **17***e* of said channel or trough. The bolster pad **20***e* is adapted to lay in the trough or channel **14***e* as shown in phantom lines in FIG. 9 when the article **10***e* is used as a bed or stool. When it is used as a back-supporting seat, the bolster pad **20***e* is laid with one of its longer sides **47** or **49** resting on the rear portion of the upper surface **13**, the third, shorter side **48** constituting an upward extension of the wall **17***e* and serving as an upper back support. The front, vertical leg **16***e* is defined by the front side of the article **10***e* and the front-bottom wall **15***e* and tapers upwardly and forwardly to an angular or rounded apex **50**. The bolster pad **20***e* is laid in the trough or channel **14***e* by rotating it 180° about is longitudinal axis as shown by the arrow **51** in FIG. 9.

As aforesaid, the preferred mateial for the articles of furniture of the invention is a fabric-covered body of a resilient, foam elastomer such as foam polyurethane. The article **10** and/or its bolster pillow **20**, however, can be made of other resiliently deformable materials such as an inflatable shell of heavy thermoplastic polymer sheeting, e.g., vinyl plastic. The latter, however, is less preferred because of its lesser durability and puncturability and also overall quality in body support and firmness.

The preferred overall shapes of the articles in the invention are those corresponding substantially to rectangular parallelepipeds. These shapes are preferred over cylindrical shapes because the latter do not lend themselves to bed uses for the articles and further they have lesser stability against tipping than do the rectangular parallelepiped shapes.

The articles of the invention are very light in weight and can be easily moved or lifted. They can be further easily stacked one upon the other when not in use. Their light weight and their overall geometry lend qualities of ease of packing in cardboard cartons and low shipping costs.

It is thought that the invention and its numerous attendant advantages will be fully understood from the foregoing description, and it is obvious that numerous changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, the forms herein disclosed being preferred embodiments for the purpose of illustrating the invention.

The invention is hereby claimed as follows:

1. A multi-purpose article of furniture comprising a block of cellular foam elastomer having an upper, body-supporting side, a front side and a rear side, said upper side having an upwardly opening channel extending across said block, said channel having a substantially vertical front wall and a rear wall sloping upwardly and rearwardly to provide a substantially right triangular transverse cross section of said channel, said front wall being spaced rearwardly of said front side to provide therebetween a resilient, deformable, cellular foam elastomer leg, said upper side having a flat surface between said rear side of said block and said rear wall of said channel, a cellular foam elastomer bolster pad having a substantially right triangular cross section and dimensioned to matingly seat in said channel, the hypotenuse side of said bolster pad lying on said flat surface, whereby said block and said bolster pad form a seat with said rear

wall of said channel and said bolster pad supporting the back of a person seated on said vertical leg.

2. An article as claimed in claim **1**, the transverse cross sections of said channel and said bolster pad each being substantially an isosceles, right triangle.

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FRANCIS K. ZUGEL, Primary Examiner

U.S. Cl. X.R.

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